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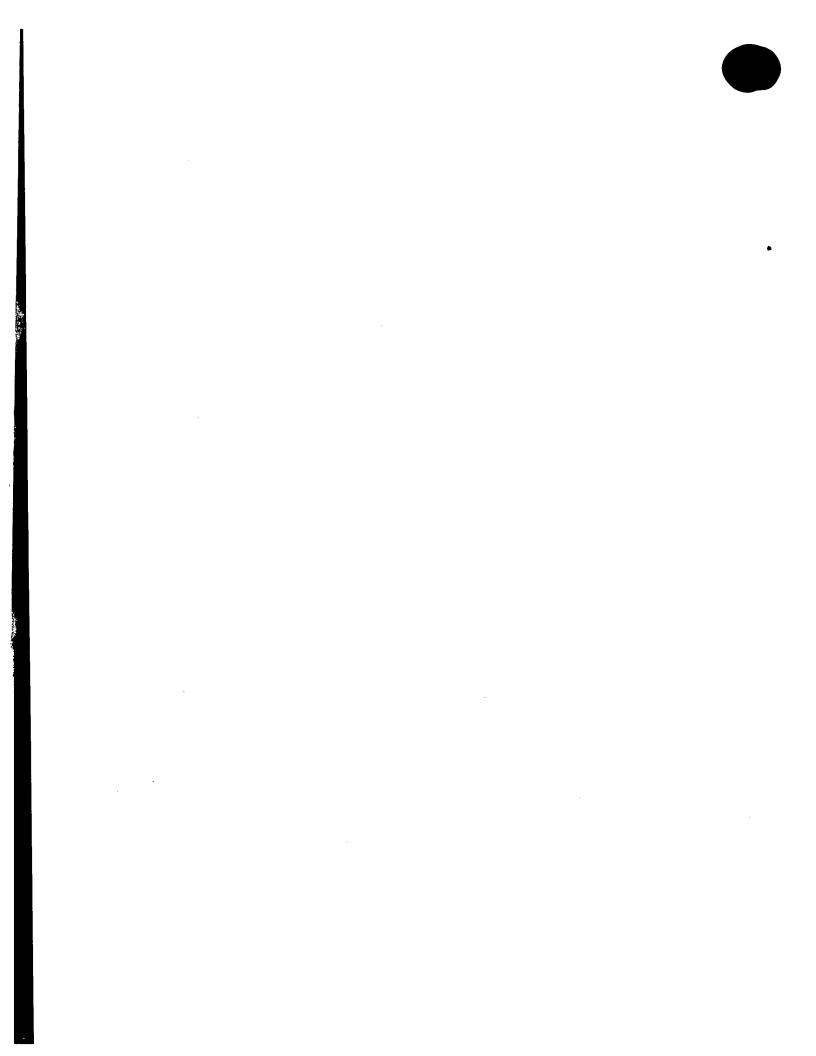COMPLIANCE WITH RULE 17.1(a) OR (b)

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MANAGER EXAMINATION SUPPORT AND
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AUSTRALIA

Patents Act 1990

CSL LIMITED

PROVISIONAL SPECIFICATION

Invention Title:

P. gingivalis sequences

The invention is described in the following statement:

P. gingivalis sequences

FIELD OF THE INVENTION

5   The present invention relates to *P. gingivalis* nucleotide sequences, *P. gingivalis* polypeptides and probes for detection of *P. gingivalis*.

BACKGROUND OF THE INVENTION

10   Periodontal diseases are bacterial-associated inflammatory diseases of the supporting tissues of the teeth and range from the relatively mild form of gingivitis, the non-specific, reversible inflammation of gingival tissue to the more aggressive forms of periodontitis which are characterised by the destruction of the tooth's supporting structures. Periodontitis is associated
15   with a subgingival infection of a consortium of specific Gram-negative bacteria that leads to the destruction of the periodontium and is a major public health problem. One bacterium that has attracted considerable interest is *P. gingivalis* as the recovery of this microorganism from adult periodontitis lesions can be up to 50% of the subgingival anaerobically
20   cultivable flora, whereas *P. gingivalis* is rarely recovered, and then in low numbers, from healthy sites. A proportional increasé in the level of *P. gingivalis* in subgingival plaque has been associated with an increased severity of periodontitis and eradication of the microorganism from the cultivable subgingival microbial population is accompanied by resolution of
25   the disease. The progression of periodontitis lesions in non-human primates has been demonstrated with the subgingival implantation of *P. gingivalis*. These findings in both animals and humans suggest a major role for *P. gingivalis* in the development of adult periodontitis.

    P. gingivalis is a black-pigmented, anaerobic, asaccharolytic,
30   proteolytic Gram-negative rod that obtains energy from the metabolism of specific amino acids. The microorganism has an absolute growth requirement for iron, preferentially in the form of haeme or its Fe(III) oxidation product haemin and when grown under conditions of excess haemin is highly virulent in experimental animals. A number of virulence
35   factors have been implicated in the pathogenicity of *P. gingivalis* including the capsule, adhesins, cytotoxins and extracellular hydrolytic enzymes. In

particular, proteases have received a great deal of attention for their ability to degrade a broad range of host proteins including structural proteins and others involved in defence. The proteins that have been shown to be substrates for *P. gingivalis* proteolytic activity include collagen types I and
5   IV, fibronectin, fibrinogen, laminin, complement and plasma clotting cascade proteins, α_1-antitrypsin, α_2-macroglobulin, antichymotrypsin, antithrombin III, antiplasmin, cystatin C, IgG and IgA. The major proteolytic activities associated with this organism have been defined by substrate specificity and are "trypsin-like", that is cleavage on the carboxyl side of
10   arginyl and lysyl residues and collagenolytic although other minor activities have been reported.

P. gingivalis trypsin-like proteolytic activity has been shown to degrade complement, generating biologically active C5a, impair the phagocytic and other functions of neutrophils by modifying surface
15   receptors, and abrogate the clotting potential of fibrinogen prolonging plasma clotting time. The trypsin-like proteolytic activity of *P. gingivalis* also generates Fc fragments from human IgG1 stimulating the release of pro-inflammatory cytokines from mononuclear cells and is associated with vascular disruption and enhanced vascular permeation through the
20   activation of the kallikrein-kinin cascade. *P. gingivalis* spontaneous mutants with reduced trypsin-like activity as well as wild-type cells treated with the trypsin-like protease inhibitor N-*p*-tosyl-L-lysine chloromethyl ketone are avirulent in animal models. Further, it has been shown that *P. gingivalis* grown under controlled, haemin-excess conditions expressed more trypsin-
25   like and less collagenolytic activity and were more virulent in mice relative to cells grown under haemin-limited but otherwise identical conditions. The increased expression of the trypsin-like activity by the more virulent *P. gingivalis* has led to the speculation that the trypsin-like proteolytic activity may be the major determinant for infection or disease.
30   There has been considerable endeavour to purify and characterise the trypsin-like proteases of *P. gingivalis* from cell-free culture fluids. Chen *et al*, (1992) [J Biol Chem 267:18896-18901] have purified and characterised a 50 kDa arginine-specific, thiol protease from the culture fluid of *P. gingivalis* H66 designated Arg-gingipain. A similar arginine-specific thiol protease has
35   been disclosed in JP 07135973 and the amino acid sequence disclosed in WO 9507286 and in Kirszbaum *et al*, 1995 [Biochem Biophys Res Comm

207:424-431]. Pike *et al* (1994) [J Biol Chem 269:406-411] have characterised a 60 kDa lysine-specific cysteine proteinase from the culture fluid of *P. gingivalis* H66 designated Lys-gingipain and the partial gene sequence for this enzyme was disclosed in WO 9511298 and fully disclosed in

5 WO 9617936.

In order to develop an efficacious and safe vaccine to prevent *P. gingivalis* colonisation it is necessary to identify and produce antigens that are involved in virulence that have utility as immunogens to generate neutralising antibodies. Whilst it is possible to attempt to isolate antigens

10 directly from cultures of *P. gingivalis* this is often difficult. For example as mentioned above, *P. gingivalis* is a strict anaerobe and can be difficult to isolate and grow. It is also known that, for a number of organisms, when cultured *in vitro* that many virulence genes are down regulated and the encoded proteins are no longer expressed. If conventional chemistry

15 techniques were applied to purify vaccine candidates potentially important (protective) molecules may not be identified. With DNA sequencing, as the gene is present (but not transcribed) even when the organism is grown in vitro it can be identified, cloned and produced as a recombinant DNA protein. Similarly, a protective antigen or therapeutic target may be

20 transiently expressed by the organism *in vitro* or produced in low levels making the identification of these molecules extremely difficult by conventional methods.

With serological identification of therapeutic targets one is limited to those responses which are detectable using standard methods such as

25 Western Blotting or ELISA. The limitation here is the both the level of response that is generated by the animal or human and determining whether this response is protective, damaging or irrelevant. No such limitation is present with a sequencing approach to the identification of potential therapeutic or prophylactic targets.

30 It is also well known that *P. gingivalis* produces a range of broadly active proteases (University of Melbourne International Patent Application No PCT/AU 96/00673, US Patent Nos 5,475,097 and 5,523,390), which make the identification of intact proteins difficult because of their degradation by these proteases.

35

SUMMARY OF THE INVENTION

The present inventors have attempted to isolate *P. gingivalis* nucleotide sequences which can be used for recombinant production of
5   *P. gingivalis* polypeptides and to develop nucleotide probes specific for *P. gingivalis.*

In a first aspect the present invention consists in an isolated *P. gingivalis* nucleotide sequence, the nucleotide sequence consisting of or including a sequence selected from the group consisting of SEQ ID NO: 1 to
10   SEQ ID NO. 1331 and seqences complementary thereto.

In a second aspect the present invention consists in an isolated *P. gingivalis* polypeptide, the polypeptide being at least partially encoded by a nucleotide consisting of or including a sequence selected from the group consisting of SEQ ID NO: 1 to SEQ ID NO. 1331 and seqences
15   complementary thereto.

In a third aspect the present invention consists in a nucleotide probe specific for *P. gingivalis,* the probe including a detectable label and a nucleotide sequence of at least 15 nucleotides, the nucleotide sequence being derived from a sequence selected from the group consisting of SEQ ID
20   NO: 1 to SEQ ID NO. 1331 and sequences complementary thereto.

DETAILED DESCRIPTION

Preparation of the *P. gingivalis* library for sequencing.
25

To determine the DNA sequence of *P. gingivalis* genomic DNA was isolated from *P. gingivalis* strain W50 (ATCC 53978) essentially by the method described by Mamur J. (1961)(1). Cloning of DNA fragments was performed essentially as described by Fleischmann *et al.,* (1995)(2). Briefly, purified
30   genomic DNA from *P. gingivalis* was nebulized to fragment the DNA and was treated with Bal31 nuclease to create blunt ends then run twice on preparative 1% agarose gels. DNA fragments of 1.6-2.0 kb were excised from the gel and the DNA recovered. This DNA was then ligated to the vector pUC18 (*SmaI* digested and dephosphorylated; Pharmacia) and
35   electrophoresed on a 1% agarose preparative gel. The fragment comprising linear vector plus one insert was excised, purified and this process repeated

to reduce any vector without insert contamination. The recovered vector plus insert DNA was blunt-ended with T4 DNA polymerase, then a final ligation to produce circular DNA was performed. Aliquots of Epicurian Coli Electroporation-Competent Cells (Stratagene) were transformed with the

5   library DNA and plated out on SOB agar antibiotic diffusion plates containing X-gal and incubated at 37°C overnight. Colonies with inserts appeared white and those without inserts (vector alone) appeared blue. Plates were stored at 4°C until the white clones were picked and expanded for the extraction of plasmid DNA for sequencing.

10

DNA sequencing

Plasmid DNA was prepared by picking bacterial colonies into 1.5ml of LB, TB or SOB broth supplemented with 50-100ug/ml Ampicillin in 96 deep well plates. Plasmid DNA was isolated using the QIAprep Spin or QIAprep

15   96 Turbo miniprep kits (QIAGEN GmbH, Germany). DNA was eluted into a 96 well gridded array and stored at -20C.

Sequencing reactions were performed using ABI PRISM Dye Terminator and ABI PRISM BIGDye Terminator Cycle Sequencing Ready Reaction kits with AmpliTaq DNA polymerase FS (PE Applied Biosystems,

20   Foster City, CA) using the M13 Universal forward and reverse sequencing primers. Sequence reactions were conducted on either a Perkin-Elmer GeneAmp 9700 (PE Applied Biosystems) or Hybaid PCR Express (Hybaid, UK) thermal cyclers. Sequencing reactions were analysed on ABI PRISM 377 DNA sequencers (PE Applied Biosystems).

25   The sequences obtained are set out below.

As will be understood by those skilled in the art open reading frames (ORFs) may be readily identified. ORFs may be determined using two methods, for example, alignments from FastX search results may be used to define the start and end positions of coding regions if sufficient protein

30   homology is present. Alternatively, protein coding regions may be identified using the ORF identification progam GeneMark (3) using a training matrix based on published *P.gingivalis* sequences. This matrix may be further refined by adding ORFs identified from the results of homology searching and ORFs identified by GeneMark. The program PSORT (4) may be used for

35   the detection of signal sequences and the prediction of protein cell

localisation. A UNIX version of TopPred (5) may be used to identify potential membrane spanning domains.

5   It will be appreciated by persons skilled in the art that numerous variations and/or modifications may be made to the invention as shown in the specific embodiments without departing from the spirit or scope of the invention as broadly described. The present embodiments are, therefore, to be considered in all respects as illustrative and not restrictive.

Dated this 9th day of April 1998

CSL LIMITED
Patent Attorneys for the Applicant:
F.B. RICE & CO.

References.

1.   Mamur, J. (1961) A procedure for the isolation of deoxyribonucleic acid from micro-organisms. J. Mol. Biol. 3, 208-218.

2.   Fleishmann, R.D. et al. (1995) Whole genome random sequencing and assembly of *Haemophilus influenzae* Rd. Science 269, 496-512.

3.   Borodovsky M, Rudd KE, and EV Koonin. (1994).   Intrinsic and extrinsic approaches for detecting genes in a bacterial genome. Nucleic Acids Res. 22:4756-4767.

4.   Horton, P. and Nakai, K. (1996). A probabilistic classification system for predicting the cellular localization sites of proteins. Intellig. Syst. Mol. Biol. 4: 109-115.

5.   Claros MG and G von Heijne. (1994).   TopPred II: an improved software for membrane protein structure predictions. Comput. Appl. Biosci. 10: 685-686.

(2) INFORMATION FOR SEQ ID NO:1

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 628 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

   (ii) MOLECULE TYPE: DNA (genomic)

  (iii) HYPOTHETICAL: NO

   (iv) ANTI-SENSE: UNKNOWN

   (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

   (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...628

   (xi) SEQUENCE DESCRIPTION: SEQ ID NO:1

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ttgcagtcca ataaacctga tgcccttccg gcgtctatct aagcataaac gacaaaaaca     180
cattagtcaa actttagaaa acattgtatg aacaaagtgt ggaaatacgt gacgggagcc     240
tttggatagc agccgtcagc gcagtagcat cggtggcaac agtggctgct ttggaccctt     300
ccgagggtgg aattcttcat aaccgatggt acggaaaacg aatcggattc aagcagacat     360
cttacacaac gacatccgga gccttcgccg cttgcccaat ttggtcggag ctgcagaagc     420
atcggtacac gccgtagtac aatcaaagtg gagtccgagc agcgaatgga ctcttcagca     480
gtacttcgat cgttctgaat tcttcttcgg aggcgaatcc agaaactttc agcgtcccca     540
acacggcagg tagtaggcta cggttcgggg gtgatcatca tgcacagagg atatatcatc     600
acgaataatc atgtagtaaa gggagcca                                        628
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(2) INFORMATION FOR SEQ ID NO:2

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 970 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

   (ii) MOLECULE TYPE: DNA (genomic)

  (iii) HYPOTHETICAL: NO

   (iv) ANTI-SENSE: UNKNOWN

   (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

   (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...970

   (xi) SEQUENCE DESCRIPTION: SEQ ID NO:2

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tcagatagac tttattgccg acatatttat ccgcgatgtt cgcacatttg agaagtagcc     120
ctgacgcata attctattca cggcagcgac atggcatctc caggaatcag gacttcatca     180
cctacagcca agcctgaaga ttgcgcaaga caaagtcatc gaaagacctc attccctcga     240
tctcatagat gctatggtct tatgaatagg cttggcatag gatatttcag ggcttatata     300
tggatctccg tgaggggtca gatccgagga ctgtcctttc aggtccctat gctggcgcag     360
aagagagctg ctacggcaat aatctttttg taatagtctt tctcaaatga ttcaatattt     420
attttctctg agagcgattt gtcgctggtc ttgccgaatc gacgctccct cgatgaatat     480
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gaatgaagag atccggatcc ggaatgcccg cggtggaaga tgatcagaaa ccaaatcgac    660
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tcgccgatag ccaagaggcg aatgttattg gtcatcaagt ccgcatctca ttcatgataa    900
gctgtaacga aaaggcccat cagcgccctg attcctcttt cggacgattc caattcttcg    960
tactgaaagg                                                          970
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(2) INFORMATION FOR SEQ ID NO:3

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 576 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...576

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:3

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agccgcacga ttggaaaaga aactggagca actcacagcc taacggcgca gagcctgtgc     60
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tacacgataa gccctccctc ttcgtaccag gatgacaagc tcttcatcac gaagagaaag    240
attcacagca gatcgccatg ggacagcatg gaagcatcca ccactctctc ctccacttgg    300
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(2) INFORMATION FOR SEQ ID NO:4

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        (A) LENGTH: 588 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...588

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:4

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caagcaatac gctccaactc ctcttgcgga aaatggtacc ggcataaaaa ctttncagtg     540
ccggtcgatt ttattctctc ttacgcatca tcttatcacc tcctagct                  588
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(2) INFORMATION FOR SEQ ID NO:5

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 473 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...473   :

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:5

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atgacttcat ggatttgtac gaaaggcaac atgtctcata atataccgcc ggccttcaag     360
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agtacaacaa cacacacgct cgctaacaca ggtgcaggta gcattctgac agc           473
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(2) INFORMATION FOR SEQ ID NO:6

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 962 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...962

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:6

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(2) INFORMATION FOR SEQ ID NO:7

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 3307 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...3307

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:7

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aaggagtgac aatatcactg cgcaagccaa aaccacaagc aagctatcag tatataagct     1440
ttggagagac tccatgctcc gctggcaata ggcgtctcga tttgacggga tgcaggcggt     1500
```

```
cgatcgctct atcgcaaatt cattgaagag atagactgca ctcgatgccg aacaaaatgc   1560
tatcaggata tggtcagcct tagcaaggct tccgtatcac caatcctgtg tccgaaaaca   1620
ggggtaggaa tacgatcaga ttcttgatcc actgcttagg tctcatgagg gagaaatgtg   1680
atcatgtatg caatagggaa agctccgatc cgatgtttct cgcagcatga caagggcttt   1740
ctcttcggct gcacgcattt gggctcatcc tttttgctct tgtctttcaa tccgcaaaga   1800
tgcagtatgc cgtgataatg acacgatgca gttcgtcttc gtatcgaaga tcaagagcac   1860
ggcattcgag cgtacggtat cgagactgat aagcaggtcg ccattcaccg ttccgcttcg   1920
caggaatcga aggtgatgat gtcggtgtag tagtcatgat gagaaattcc tgattggctt   1980
tcaggatata ttcgtcatca cagaaaagaa ggagatttct cccaccgctt tcccatatcg   2040
gctgcatact tcggctatca cttaccgacg atccgtcttc tgatccgagg aaggctgacg   2100
ccttcagata gaaattgatt tttgccattg tcttaattat cgttttgctc ggtcacgtac   2160
cctcaaccaa agaaaatata agtgacagca atggctgtca gcgctcggcc aaatcggcca   2220
aaagggaata gctcaccgta taacgtgtat tgcgattttg acggctccat agtagagggc   2280
tacgacgtag aacgtggtat cgcggagccc tgtacaatac tgcatagacg gccgacaaag   2340
ctgtcggctc cgacgtctgc atggcatcga ccatgagccc tctggctcca cttccgctaa   2400
gggtttcatt agcatggtcg ggattccttc cacaaacttc atatctcctc ccaaaagccg   2460
accagtccgc gcaagccttc agtgatcaga tccatggcac ggaagctctg aatataccga   2520
taccgaccag catggccagc agatagggat gatggtcaca gccgtaccga aaccatcttt   2580
tgcccttcg ataaaggatc atacacattg atgcgtgcac gcagtccact aatgacgaat    2640
ccgcacttat tccaaacaga agaatggatg caaatgcagt gctgatacaa ctaaagtttc   2700
cggaggcaga gtccgtcctg catagattac ccctccgata aagaaagaga ggaaagaaga   2760
aaaagaagaa gaggtttttg gaagaaatcg atagctgctt gatccctact gcaaggatgg   2820
cgaccaatgt ggaagcaaac gtgcaatcag aaccgggaca aagatgtcgg taggatttgc   2880
cgccccgacc ttaggcgata ggccatgatg gaagagggaa tcagcgtaag tccactggca   2940
tgatggccaa gaacataatc atggcatcgc tggctttatc tttttgctgt tgatcgtttg   3000
caaactctcc atcgaacgga taccgagggg ggtagcagat tgtcaaggcc taacaggttg   3060
gccgatatat tcatgaagat attgcccgtg cgggatggtc cttaggtaca gaagggaaca   3120
atcggcttag aacaggaac tgatctgtgc cagcttgctt ataaggccac ttcgttctgc    3180
tatttcatca gaccgagcca cagagcgagt acactggtca gtgcaagggc tatccaaagg   3240
cattcttcga ctggctgaaa gaagcctgca ccatcgcatc gaaacggaca catcgccgaa   3300
agctatc                                                             3307
```

(2) INFORMATION FOR SEQ ID NO:8

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 605 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...605

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:8

```
agcagccggc cggccaacgg aaagcttcgc cccccatggc 'ggcacgaata tttcgataga   60
cacgtaagaa gggctttgga aagacgagcg accacgtact tgataatgtt ggctcccccc   120
ttcacgacac gctgtttcag ttctgccact gctcgttggt cagcttgtcg gtaccgatca   180
gatcggtcag aggcgtccgt ttaccttggc cgtgctggcg aaaacagcca tctgctcgcc   240
atgactccat aagtacgcgt gttggtcacg agactttgtt tgatgccgaa gtgctagcca   300
gttcgctttg cagacgtgtg ctgtccaaac cggccaagt agtacctgcg aaggcttcag    360
cccggagtag ataagcgtaa caagaccggt gagtcagccg gattgaagat gatgatcacg   420
tgcttacagt cgggacaata gtcttgatgt ccttgcccag ctgagcagcg atttcggcat   480
tgcccttgag agatcctcgc gggtcatacc ctctttgcgc ggagcaccgg ccgaagaaat   540
atatatttgg catctgtaag agcctcttga tgtcngatgt aaaagtcaat tcaggccttc   600
gaatc                                                               605
```

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(2) INFORMATION FOR SEQ ID NO:9

    (i) SEQUENCE CHARACTERISTICS:
       (A) LENGTH: 688 base pairs
       (B) TYPE: nucleic acid
       (C) STRANDEDNESS: double
       (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
       (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
       (A) NAME/KEY: misc_feature
       (B) LOCATION 1...688

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:9

```
cctgagccac acactggtct ataatggcat tggacacttc ggccagacgt atacgttggc    60
ctcgcgagca cgatagtcac ctcctttgat cgtatcgtga agagtcgata aacggagtcg   120
ccgtcgttct ggtagttctt ggcggcatga tacctccctg tgcagcgatg gagtgcgcac   180
ggcgaggaga atcctgatgc agaagttaag cacattgaag cccatctcgc cgaaagaagc   240
agcagcgaag caccggccag gccggtaccg accacgataa tatccagacg acgttgttgg   300
ccgggttcac cagcttctga tgatccttat agttggtcca ctttctttca gcgggccggc   360
gggtattttg gaatttattg tagccatagt gaaatacttt gaattagggt gtactatcaa   420
ccgatgaatg cctgacaagc aatactatca ggaccaaagc gaaaccgcct accaatacgg   480
tagaaaccac ttagagatgc acttgacacg attcatccag atggtattgt tccatcccag   540
gtctgcagtg cactccagaa tccatgtgtc aggtggaacc acaaagcatc agccatacgg   600
catagagcac cacgtagatc ggttggttga atgtgtacgg atcagctctg ctcccttggc   660
cggatggtcg aaaccatcaa taccgatc                                     688
```

(2) INFORMATION FOR SEQ ID NO:10

    (i) SEQUENCE CHARACTERISTICS:
       (A) LENGTH: 1422 base pairs
       (B) TYPE: nucleic acid
       (C) STRANDEDNESS: double
       (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
       (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
       (A) NAME/KEY: misc_feature
       (B) LOCATION 1...1422

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:10

```
tcggtcatgc cctccacggt atgtttcccg cccagcagta tcctttgctt ccggtacgaa    60
tgtggcgcgt gacttcgtcg agatgccgtc tcagctcacg aacattgggc tatggatccg   120
gaagtgtttg ccaactacgc taagcacgga agacacagga gcctatgccg gccgaattgg   180
tcaagaagat tcaggagcga gcgacttcaa tcaggcttat tctatgggag aaaatcttgc   240
agccgaagcc tcgatcaggc atggcatacg ctcacggtcg aagagncgga ggccttaccg   300
acgtggccaa gttcgaagaa gaagccctgc gcaaagtcgg tcttacaatc cgcagatacc   360
tcctcgctat cgctcctctt atttccgcca tactggagca atggttatgc atccggttac   420
```

```
tacgcttatc tgtggacaga atgctggatc acaacgttta tcaatggatg gtgcaaaacg        480
gtggtatgac ccgcaaaacg gacaacgcct tcgggatatg attctttcgc gtggcaataa        540
caggatttca acgtgatctt caccgcgttc accggtctgc aaaagcctac atcagggatt        600
tgctccgcgc tcgcggtctc atgtaataca gcaatagcga ggctgtgctt tcaggttcca        660
agatcctgca agagcacagc ctctttttat tcaccctata ccaaaaacga aacagctacg        720
atgaaaaaag gagattactc atccttctga tcattatcct gatgttgggg cttatgcttt        780
cccctggaca tcggaaacat tcaactccct cagtcgccat tatccttatt atacggtttc        840
ctgaagtttg ccatcttggc taccatcggt gaagtactgg ccgacggatc aaagcccaac        900
gatacacctg ccccacctat ctatgggtgc gattgtgata tggggcattg tcggtatact        960
catcgtcttc aacttcgggt gtacgaagcc ggtatacgag gtatcatcgc aagaggactg       1020
ctccccgact cgacagttcg gtctatacgg ctttccttat ctcttccgcc atgaatctac       1080
attcggcccg gccttcatgg ccgcccaccg catcagcgat acatatcgga gaataaagct       1140
acaggacggg gaggaagcat ccggctcgcc gttgaagagt ggattggaat cgctttatga       1200
ctttcgtcgt tggcaagacc attccttctt ctggataccg gcacatacgg tcaccttttt       1260
acttccaccc gagtccgcgt ctttgtggct gcactcctgt ccatcgctct gggactgatc       1320
ttgccttggc ttcctcccga catgcaaagg cgtaaaacat cagggaccga caaaggattt       1380
gataccaaaa tgatgaaaat gccatgaagg aactgaaatg cc                          1422
```

(2) INFORMATION FOR SEQ ID NO:11

      (i) SEQUENCE CHARACTERISTICS:
          (A) LENGTH: 713 base pairs
          (B) TYPE: nucleic acid
          (C) STRANDEDNESS: double
          (D) TOPOLOGY: circular

     (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

     (iv) ANTI-SENSE: UNKNOWN

     (vi) ORIGINAL SOURCE:
          (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

     (ix) FEATURE:
          (A) NAME/KEY: misc_feature
          (B) LOCATION 1...713

     (xi) SEQUENCE DESCRIPTION: SEQ ID NO:11

```
ggcagtagcc tgttcggcag canccgtggc ctcacgatcg cgcaggtttc caccataccc         60
tcgtattcga gtgctnccac acgattggcc agctctattc gcgtacctta tccgttgtac        120
ctgctccgat gctatccaaa tacctttgct ctggagctct gctcttcggc ggtcgttctg        180
catggctttg accttggttc gcgtcgcttg gcgttgagtt ctccgcggag ttgtacttcc        240
tgccgtgcag ttgggtctgc ttcatccgca gttcgtcctg caatttctcg aactcgtgcg        300
cacggactgc aagtccagtt ccaacaaggg ttcacctcgg tgtccgaatc gcctgcatgc        360
ttgagcacag ctatcagacg cgcctgcacc gggaagtgat gatctcctcg aaagccggca        420
ccacttcgcc ggaagccgag gagcgatctg cacttctcct ttgtccaccc gccccaaacg        480
cagagaggct cggatatgga gccttggatg gaggagagca accaccatcc gcctaagaaa        540
gaaggactgc cgaagctgtt atgattgagg taaccgtctt tgcttttccg ttgagccgtt        600
cggcgaaact tgtctgtcat gaatcggttt ctttttcgg tgcgagcctt tgttgctcgc         660
cggcttccga agagcaaatg ccatgcaaac aaatccctgg ccttattaat cag              713
```

(2) INFORMATION FOR SEQ ID NO:12

      (i) SEQUENCE CHARACTERISTICS:
          (A) LENGTH: 756 base pairs
          (B) TYPE: nucleic acid
          (C) STRANDEDNESS: double
          (D) TOPOLOGY: circular

     (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

(iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...756

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:12

```
ggttgtccgt aaacgtggaa ccgtgtctgg cacgtgtatt ggtcgtagga aaccgacaat      60
atcgggcgga gagtacacag gcgatgtttc ctgctatgca ttgatgtagt accacaaagg     120
atatacccct tgcgccattt ggccaaatct ccagtggcac taatgaagcc tatggagaca     180
attcgcctct tgctgacgtt atgcctcaag ttgggcagag gaatcgatag ccgccggtgt     240
agcatcaaca acgtctatgg gtatgtcaag gcagacatgt ttgacaatcc tgtgcagcaa     300
ccaagatgca ggagaaaaag acggacttca atctgaacca agtgcgatct atacaaaaga     360
atcgaccgta aatcctaaaa actactttac ggttatgtgc cgagagtagt cttgcgtgca     420
aaatacgttc ctcatggcat cccggcgtga agccggatga aggctggatc gaatttcagg     480
gtagaaagat agtctggagc agttcaaaaa atacgtagac aatccggttt ctgccggtag     540
gctctggccg acagcatcaa gaaggcgaaa gctgacaatt cattggtcat acaggtggat     600
tcgtcagtca tggaatacag ttctattaca aatcgcaaat tattatgcca tccctattcg     660
ccatttcgat gatgaaaaag ctcctacaaa gattcctacg ggcgtttcgg cctcgtacga     720
aacaatgagt atatctctcg gtaaagtcca ttacag                               756
```


(2) INFORMATION FOR SEQ ID NO:13

        (i) SEQUENCE CHARACTERISTICS:
                (A) LENGTH: 549 base pairs
                (B) TYPE: nucleic acid
                (C) STRANDEDNESS: double
                (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
            (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
            (A) NAME/KEY: misc_feature
            (B) LOCATION 1...549

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:13

```
acgaactgaa aagcgttttg ctgaaagacc tctatgacaa tggcgagaaa tcattcgaaa      60
ccagcagngg cagatcgatt cgctccgaaa tgtattaact tctacaaccg tttctcttcg     120
atggagagtg agatagccca agagctgaag tgattttccc ctctatcaat tcggctatgc     180
tggtaccttc gtccgggtgg cacagggtag ggattccgtt ttgctcgtcg tggtgcgtcc     240
gaaagccgga taagccagtc ggaaataaac aagctaagca catggatggc tacggtacca     300
agaccaagaa agtgcgcctt atcatagaca ataatcatag gtacaaccat aaacagtaat     360
gcaaatgaaa ttaaaaagta ttcttctcgg agagccctgc tgttgggtgc ttaaggggta     420
gccaaagccg acaaaggcat gggctcctca acgaactcaa'tcaggagaat ctggatcgaa     480
tgcgtgagct ggctttacct cccgtggatt cgctctacag tttcgacaag ccgtccatgc     540
atgcccgtg                                                             549
```


(2) INFORMATION FOR SEQ ID NO:14

        (i) SEQUENCE CHARACTERISTICS:
                (A) LENGTH: 300 base pairs
                (B) TYPE: nucleic acid
                (C) STRANDEDNESS: double
                (D) TOPOLOGY: circular

```
        (ii) MOLECULE TYPE: DNA (genomic)

       (iii) HYPOTHETICAL: NO

        (iv) ANTI-SENSE: UNKNOWN

         (vi) ORIGINAL SOURCE:
              (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

         (ix) FEATURE:
              (A) NAME/KEY: misc_feature
              (B) LOCATION 1...300

         (xi) SEQUENCE DESCRIPTION: SEQ ID NO:14

gagttctgct tttttagctg aatccaaata cattttcttc cgtttttttac gtgttaaaca     60
ataactactt ccgctactac ggtcgtagat ctggccgcaa gataatataa ttccctatac    120
cacagcgcga atctgtttct tcgctctgtt ataacgatgc cgttggacgt acggatctac    180
attgggccaa gcattcagga aaggtgaact cgcccttctt tgcatttttg ggtccaaaaa    240
caagcaagaa agccgagatt ctatttactt ttgtgcactc tttgaacgaa aatncgctta    
300


   (2) INFORMATION FOR SEQ ID NO:15

         (i) SEQUENCE CHARACTERISTICS:
              (A) LENGTH: 665 base pairs
              (B) TYPE: nucleic acid
              (C) STRANDEDNESS: double
              (D) TOPOLOGY: circular

        (ii) MOLECULE TYPE: DNA (genomic)

       (iii) HYPOTHETICAL: NO

        (iv) ANTI-SENSE: UNKNOWN

         (vi) ORIGINAL SOURCE:
              (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

         (ix) FEATURE:
              (A) NAME/KEY: misc_feature
              (B) LOCATION 1...665

         (xi) SEQUENCE DESCRIPTION: SEQ ID NO:15

attacaagga aacctcttga tcgtaagcgg atcggcagac gacaatgtta tcttcagaac     60
acgatgcttt ttacagaggc actggttcag gccaatatcc cttcgacatg gctatctata    120
tggacaagaa ccatagtata taccggggga atacccgcta tcatctctat actcgcaaag    180
caaagttttt gttcgcatct tttantacag nttttctcag ttgcttgatg gggcgagtgg    240
cgaaggggtt tttgttcact tgctccgttc gacagtggtc tctaatagct cttttttgaaa    300
aaactatggc gcaacacgtc aagaaacccg aatggttgaa aatcgtcttg gtgggaatga    360
gaagtttacc gagactaaaa gcattgtcga ggacattgtc tgcatacgat ctgtacaagt    420
ggcaaatgcc ccaatatggg aagtgctgga gtaggggggac tgctaccttc atgatcggtg    480
gtgatatctg acacgtgcct gtcgattttg caacactttg acggggcgtc ccaaaccgcc    540
aatgaagcag aacctactca cgtcgcattg agtatcaaac'tgatggggtt aaccatgctg    600
tggtgacgag cgttgaccgc gatgacttgc ccgattaggt gccgcacact gggttaagac    660
cattc    
                                                                      665


   (2) INFORMATION FOR SEQ ID NO:16

         (i) SEQUENCE CHARACTERISTICS:
              (A) LENGTH: 2330 base pairs
              (B) TYPE: nucleic acid
              (C) STRANDEDNESS: double
              (D) TOPOLOGY: circular
```

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(ii) MOLECULE TYPE: DNA (genomic)

(iii) HYPOTHETICAL: NO

(iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
    (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...2330

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:16

```
tttttgaatg tctgccggac tgagatttga tcgtaatgct cttttgggaa ggtgatattc     60
agacagtcgt atgtggagcg aatcctatcc agactctccg gactgctgca tcggggagtc    120
ctaccatact tgagatagca acctcggtga tattgacttc gacggtaacg gtaagggcgt    180
ctatgctgtg cagagcgcgg caaaggtctt tactaacata ataaagaaac agggtgcgaa    240
aggacatcgg agactgtagc ttgcacggcg gctacggata tttccggctg tgtcatgtgg    300
atagtatatg gaaggctgtc tatgccatat cgctcgagaa gtgcgatacc tgtccgatac    360
tatccgatgc cacacgtccg ggcaaagcca actcctgatg agtttacgga gagatgagtc    420
cggtgcaaag agcgagagag tagggtttcc ggctttgtct ttccttcttt atctctccat    480
actttcaatg tgtagcggta gtggagtcag gcttgttcgt gaagagcaaa agcacatctg    540
tcccctatac caggaaagag tgaaagatcg ctgatcaata tccttgacag gaagtccgga    600
gccaaacggc cgactgcgta cgacttattc cggctaagat ggaatcaaga gacggggggaa    660
gccggtgcat cgagataccg gagcgggaat gaggtctatg tcgaaaggt cgtattcctc    720
cgctaatctg tttatccggt ggcatcggga tgggaaagat agaagtcaag ggctttgagc    780
cgcagtctct gaaggctttt gctttggagg ggaagtcggt ggttcggaga tgacctgata    840
gcgatggatc tcttcttctg cagtttgcat gaactcgttc aggtggcatg tgtacttcct    900
cctttattt taggcaggag gggttggtcg gatcgagagt gattttaata tcttctccct    960
tttcaggata gagccgaagc cgttattgcc ctcgttgaaa tataatagaa tgcgactaac   1020
atcgccttta tttcgtgtcg aatctgtgcc ttgggcgaag taacgtgtat ctcttctggc   1080
gaaaggagcc ttcccttca attcgcagag ccagaaccga atcgcctggc tgagattgga   1140
gagattcagt ttgaggtggc aaacatcaga tgctctctgc atgaaagaga aaggagcagg   1200
acaaaacctg ctactatata atatatatgt tggatggctt ggacattggg acggagtgtt   1260
tcatgattcc gtagaagtcg gagcaggtat tcctctacag tttccggata gtgtgcatat   1320
tccaagcgtg gattctttgg gccagcgtat ccggagtatc ttccggaagg acggacagac   1380
tgcttgacgg aggattttgc cgtggtcata atgtccatcg aaagatgaat ggtgataccg   1440
ctttcttttt cccttgcagc aaggacggct cgtgtacgtg atgtccgtac attccttttc   1500
cgccgaactt gggcaataag caggatggat attgacgatc ctgtcgggga aggattccaa   1560
gtagggtggg ttatataaca catatagccg gccagcacga tcaggtctat ccctaatctt   1620
tcaagagggc aatgggcttc gatccttcga gcatctcttg ggtagtaacg aataagccgg   1680
tattttcagc cgatgggcac gtgccataac tcctgatcgg agtgattgct gaggatcaca   1740
gccaagcttg ccgaacctct ttggcaaaga aatgacacag attttctgca tttgagccat   1800
taccggaagc taaaccgcta cttttctcat tttatttact atttttgctg cacacaaaga   1860
gttgattgtg cagatttttct ggcgctgata atggactaac acggtatttt cgtgctaaat   1920
ccgctaaaca gcgctaaatg aagcacaaat ataagtaaga gattattagt aataaccatt   1980
ttaaagaaca agactatgtc tgaagtagaa aaaaagtgat cgacctcgta gttgacaaat   2040
tgaatgtaga agcttctgag taacgcgtga agccagtttc tcaaatgacc ctcggagcca   2100
gactctctga tacagttgag ttgatgatga atttcgaaaa ggaattcaac atgtcttccc   2160
tgacgaccaa gcacaggaga tcaagactgt cggcgacgct atcgatatat cgaaaaaaac   2220
ctgaagtaaa atactccgat ggaactgaaa agagagtagt aacagggtta ggagccatta   2280
ctccgcttgg caactctgct cccaaacgtg ggaaagctta gtggcaggca              2330
```

(2) INFORMATION FOR SEQ ID NO:17

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 557 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

(iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
    (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...557

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:17

```
ggggacacgc atcagtctgc atagctcggc agagaaggtt tcacgcgtcg gcgaatgccc    60
agcgatccgt ccgaagcgat gagtgccggc gccacgcctt ggcctgagga tagatgatgg   120
tcagcggttt ggtcgtcagc tcgatcaatc ccaggccaac tccggcactt cgtccatgag   180
gccttggagc ttcgctccga atcgatgaag gaccaagcat gctctngctg tccgctcttt   240
ctttcgccgg taaatccgct ggacggcttc ttcgttcgtg gcatcgcagc ctatccccaa   300
atggtatctg tcgggtaaag gatgattccg cctttgcgca tgattcggcg gctttcttcg   360
cttcacttct ctgaatatcg ttgagcatat cgtgggtata tctctatttt ttcgagagag   420
ccgagtgcgc tcactccttc agggcaaaag tatgaatatc tgccgtatca atgctttaat   480
atgtcatttc tagtcttcat cggttatttc tgtctgtttc tttattttat aaatgatcat   540
tccggccgga gaaagtt                                                   557
```

(2) INFORMATION FOR SEQ ID NO:18

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 7455 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...7455

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:18

```
gtaccaaaac tcctgcaatt tttttgtttc catatatgaa gtattatgtt ntgttaagtc    60
atcaatgttt atatcagatg gtaatgcgtc atcgttttaa cgctgttcaa atctcgttgt   120
ttctcattct ctgcagaata cgcatgttgc aattagaaga ttctttgcaa cagacaaatc   180
tatttctccg gtaatgtctt ctccatgaaa agcaatgcct cttttggagc ttcattcttt   240
gataacttcc tgctaaaatg aggatttgag caatgagagc atctcctcgc tttgtgcata   300
aatactgctc tccatcatca ctaaaaattt agctttttct tcaagatatt tcctggagag   360
attcatgaat cggcttcttc ttttgctgca aatatgcaac ttggttgagc ccaactaacc   420
caatatctgg gcagatgcaa tacgtcagtt tttaatttct ccattttggt aaaaaacatt   480
tgaaataata tttgatttga tttggatatt ctactctgga gctaaaaaag tcatcgaaac   540
tgccttattg aatgattgta aaaaacgatt ggtgaaaaag tcaaatcgtc ataatcggta   600
tccccataaa ctctttttttc tttttttatag agccgactat aaaataagct atccactata   660
gagtgtagtt tcccctcttt tgctagtcta ttatataatg atgaaacgta aatggaattg   720
cattgccgta tgtaacagat acaaggttga tcctttcaat gaatctagca ccttttgagc   780
aagattgaaa attctgcatg cttggcaaat tctcctatag cccctaacaa cgcattgctc   840
ccattctgtc acttttgggt gaattaggga aattccctcg aagatttttg gacgatgagg   900
aattccttta ttatctatgt ttcctaacat tcctctcctg ataaatgagt gatttgcatt   960
ttgtcaaaga gagctatgaa tcgaccattt gattgagtgg gatatcagga atgatgcaaa  1020
aattatcttc ccgacttgca atgcaggctt taagggcgtt agtgtagtaa taagtccaat  1080
gtttgttctt caacagatat ttttgcagag cctcgcccag tatcttttcg ccaaaagtca  1140
ggtattctcc ggatatcggg atattagaca tgctcaattg tctttttttga gtaagccttc  1200
tcgttcattg tctttgccta aatagctatt tcaagaaatt tagatgcttt tgtccaaact  1260
```

```
ttttgggcgt gcattctttc gtgacaatat gtggggagag aaatattccg ttctttgtgt    1320
ttcatctttt cttttgacaa aagagaaacg ggcctttgat cctggggaaa aagctcctgg    1380
gcttggatcc taaaagagga aaccgctttt tcaatgctga actcaattct tttggagtta    1440
gcctttccct ctctgataca tgattatcat cagagttatt gcacatccat atcggatata    1500
ataatgattt gtattcatgc tttttcttcaa ggtaaagtgt aacccaacct tcgctgttgc    1560
ccaaataccc atgttttgtt gggggagtgt ttttgatagc aaatcaacca gttgaggtcc    1620
attttaatta cacattcata atttccttca aaaaataaat attccattt gtaggagtgg    1680
tgtagaagaa agatattcta tcaatatttt ctcgtaaaat ttttcttctt tttgatctgt    1740
cttttcttct gtttccaagg ttcttcattt tcacacataa atctaaattt atccataact    1800
agcgtatagt caaattttga gtgcctccga aatggatttt ccctgcatct ttcctcctaa    1860
aacacgcttc cataaatcgt tataaaaaaa cgggctatcg gtggaaacaa tcgaacacta    1920
tctaactcga agaaatcgga taataatggt atgaagatcg gcggatagtg ggagggatgt    1980
atccttttttt tgttttttttt cttatattct tatctctttt gttattattt ctcggtcttt    2040
acgactaaaa tgccacccaa aacattctcg aacaaaccac aaagaatatg cttgtcaggg    2100
tacaaaaagc cttgtagtat gatcccggaa gttcgcttac catagagatt ggagcggtgg    2160
ttcaatgtgg agctttatcg acgcagataa atccgggtct tttccagtat ggatagatct    2220
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gcccgcgttc catgcgaaca gctggtctcg gcattccta ttatgcggat agggcaccaa    2340
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gaaaatgaat aggagatact tttgccgtgc atacgttttc tccgagccat ttttgaagag    2820
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ttccgaggaa ttttgcgaaa accgcactga aaatagaaag gggcgagggc ggggtataaa    3060
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caatggcatt gatgccggcg aacaatagag gaagactgtc aggtaagctg ctacggctgc    5220
atcgtgcctg agtccataca ggaaatggcc gcaatatctc cgⱺtggaagt gcctatcccg    5280
gcaagccggc caagtacacg agcaggaata tgactttctg aaagaggaaa tagagcagaa    5340
```

```
aagaacaaat actcctatta cgtagcagaa accgcttctt ttccgaaaca aagctctcct    5400
cgttcgaaca acgtcttcat atgtcaggct gtcggacgct tccgcgcaag aagaaggggc    5460
gtgctatcgc ccacacaatc cccagcagag tagtgccaga gctgtcttgg ctatagcttc    5520
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tccagtcacg gagtatatag ttggcacgaa tgatcggtac agcttggtta tcgatgtcgc    5640
tgtccagcca tgaggatagt atatctcgga aaatatgccc agcagggttg tgtgctcaca    5700
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atgcatcaga gctaatatgc ccgagcgaac attcacgagg gtagtcttga tagctgctgt    6420
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gggagggcac aagggcaaaa agaagcgatg ccccaaggtc agaagtgtag ctgcaaccca    6540
agcagtacgt tcgcgcttaa ggagggtttt ccctctttga ttatttccac caaagccata    6600
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gagagtagaa tagacaggat ggtggctgcc agcaaagccc actgacaggc cctttgacga    6780
taaaacaacc caagacaaag agaaagagaa caaagctcct acatatacag gccctgccgt    6840
gaatggttgg tctccccagt gcgattcata cgagctatcg cctgagcata ggatggattc    6900
acggtttcct caccttttcg tcataaccca agtaaccgga ggatcctcct ttaatatcgg    6960
gataaggagc gaccaagtct cacctatacc ataactccat tgtgtgaata ggccttgtcc    7020
agtccgcttt tattctcatg cgtcacttga tccgtggtgc tccgctctgc ttgagcgtca    7080
gttcgctacc tccacgcatg gtctcttgcc gtattggtag gtgtggaaga ggttggtact    7140
attcacagct ataccaccag acctgctatg acgactactg ccgaggaaag gaagaagtgt    7200
cggttcgttt tgttcgaatg gcttctgcca agaaagccaa caccatgaaa aaatgacgaa    7260
caggaagtaa tagctcatct gtacatgatt agccaagact tcaaagccgt gaaaaaagcc    7320
atcacgctac cgcctgccaa ccacctccca tgtagatcca gatcataccg gcaagagtag    7380
gaggaataaa acacatagcg tcagcttcca tatatgtccg gccataatca gaatcaggaa    7440
gtaggaagaa aggcc                                                     7455
```

(2) INFORMATION FOR SEQ ID NO:19

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 672 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...672

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:19

```
ggctgcaagt atcgcgtccg gatcagtgca caacggtatg gtttcattcc atcgaatgct     60
gttgttttac ccggtcatca gggagacgat ttgggtggtc acagctgatg tattcccgtt    120
tggcagaaag caaactttcg cccaacggct gtcgcgtatc ctctactccc acaagcagat    180
gaatcagcag ttcgacggaa gcaaaaggaa cgattactat ccatacaggc aaagctgttt    240
tcctctacga caaggaacaa caacctgctt atcgcacttt cgagcagtat atgcgtggga    300
aaacatccct aagtatatgc tcaacagcca gcaatcatgg ggatcttcgg attagatacg    360
gtttgtatgc ttctcgataa ggaattgctt gatttgccta ctctcttccc ttcgaatacc    420
```

```
gctacggaaa gcgtatctat gtgatatttg tcgtgaactg tatggcgaga aaggcatttc    480
tttttcggac atttgaacct gcatggcatt atctcttctc ctgtttaccg actcaaacgt    540
ctctaaagcc tttgcttcga ccatttatac cccgtccttc gatttggaag gcgatattat    600
cggtttttgga acggatcatg caacctgtat taccgacggt agagcaagga cgacgtttcc    660
acccgacatc ta                                                        672
```

(2) INFORMATION FOR SEQ ID NO:20

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 2497 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...2497

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:20

```
gcctatctct gtgatgacaa agtcggtact gactcttttg tcccaggagt tgacgttgcg     60
cttgatctca tccgtaatat gaggcaccac ttgcacggct tgcccaagta ctcgcccttg    120
cgttccttgc ggattacgtt ctgatagtcc tgcctgtcgt gatattattg gcacgagtag    180
tgggcgtatt gaggaacgct catagtggcc gagatccaaa tcggcctcat gtccgtcctc    240
ggtgaatagc attcgccgtg ctcataagga ttgagcgtac cgggatcgat attgtatagg    300
ggtcgaactt ctgaagagct acgttgaaac cgcgagcttg gagagtttgc cgagagatgc    360
tgctacgatg cctttttccaa gagaagaaac caaccaccgg tcacgaagat atacttagta    420
tctgccatag cgcgaaaaga tgtattgttg atactttgat cgataaatca ggggtacgga    480
aagctacccc aacggaccag cctcctccga ttcgtgcgca aatatacaaa aagaacgccg    540
ctaaaagagg caaatacgac agctcttgcc cgatgccggc acatcaaatg agaaatgagg    600
catccgacga accgcgataa ggctatccga ggcaaattac gcgccggaaa tgctccgatt    660
gcggttcgta aattctcgaa aacacggcga gattttttcc gttttggttc gggaaacaaa    720
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taaatttgga ggaaatttca gagtttcact cctaatacta catcagaaca tggctgtctc   1080
atcaatgaag tttccaggac gttcggcgaa tatcttctta ttcccggctc actacagaac   1140
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gattccaatc tcagaccgga caatacgctg gccgatgtat tgatctggtc aaaaggacag   1440
gacataataa tataggtatc actcacgacg ttcgtccaat ggccgtctga tgggtatcgt   1500
cacgagcaga gactatcgct cagcacggac tcaccctcga agccggtcaa agattttatg   1560
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tatttgggaa aacaaactca atacgctgcc gatcatcgac gaaaatagaa tctgcagtat   1680
ttcgtcttcc gtaaagatta cgacagccac aagaaaatcc gctcgaactc tccaactaca   1740
cggacaagac cctcctcgtg ggtgcggtat caatacacgc gactataagg agcgagtacc   1800
tgcactggtg gagccggtgt ggatgtggtg tgcatcgact catcggacgg ctattccgac   1860
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cacttacttc ccatctgtag cgatggaggg ctcgtacatg actaccacat ggtgctgcat   2160
tggccatggg tgccgatttc ctgatgatgg gacgctattt cgctcattcg acgagtcgcc   2220
gaccaagaag atgaagatag gcagcaatat cgtcaagaat actggggcga aggatcgaac   2280
```

```
cgcgctcaga actggcaacg ctagacagcg gcggcaccga gacgctcaag ttcgaagaag   2340
gagtggacag ctcgttccat acgccggtaa gatgaaggac aacctgctca tcacactcgg   2400
cagatcaagg ctacgatgtg cagttgcggt gtcattacca ttcccgagct caagagaaag   2460
ccaagattac cctcgtgagc agcaccagta tcgtcga                           2497
```

(2) INFORMATION FOR SEQ ID NO:21

        (i) SEQUENCE CHARACTERISTICS:
             (A) LENGTH: 630 base pairs
             (B) TYPE: nucleic acid
             (C) STRANDEDNESS: double
             (D) TOPOLOGY: circular

       (ii) MOLECULE TYPE: DNA (genomic)

      (iii) HYPOTHETICAL: NO

       (iv) ANTI-SENSE: UNKNOWN

       (vi) ORIGINAL SOURCE:
             (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

       (ix) FEATURE:
             (A) NAME/KEY: misc_feature
             (B) LOCATION 1...630

       (xi) SEQUENCE DESCRIPTION: SEQ ID NO:21

```
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ctgtcccagg ttcatacggg agggtaccca agagggttta ggcatatgtc taccggagta   180
ccgtctgcga ggaacgcata tcctcttgac gcacgatttt ggacacaata cctttatttc   240
catgagtccg gccatcttgt cgccaacttg gatcttccgt ttcttggcta tataactttg   300
gccatttgaa caataccggc aggcagttcg tccccgatgg tctatctaat ttgcgacgcc   360
gtagttcagc ttcaatctcc ttggagtgct tcgataattc accgcaacag ccttaatcaa   420
ctcgttcgta tgtgcatcat tgtccaatca cttaattgga tcacattgaa atcaagagct   480
tcaagatctt tttggcgaat ttgctgccgg ccttaatcaa ctcaacattc aagtagtcct   540
tacgccacag caggtttttgc ctttggtcaa gttctggtag cttgtcgaca gacgcttcat   600
gaagtggtgc tgccttttcg cgtatgtttc                                    630
```

(2) INFORMATION FOR SEQ ID NO:22

        (i) SEQUENCE CHARACTERISTICS:
             (A) LENGTH: 454 base pairs
             (B) TYPE: nucleic acid
             (C) STRANDEDNESS: double
             (D) TOPOLOGY: circular

       (ii) MOLECULE TYPE: DNA (genomic)

      (iii) HYPOTHETICAL: NO

       (iv) ANTI-SENSE: UNKNOWN

       (vi) ORIGINAL SOURCE:
             (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

       (ix) FEATURE:
             (A) NAME/KEY: misc_feature
             (B) LOCATION 1...454

       (xi) SEQUENCE DESCRIPTION: SEQ ID NO:22

```
catccccggc aatcccagcc acatatacca gaacataggg gctacaactc atcgctcaga   60
ttctccgaca aagtctccaa agctgccgtc ctgacttctg ggccgacaga gcagccgtat   120
cgcgccctac gattcgcgtc acctgttgcg cccttcttca agcgaacgat cgactgcttc   180
```

```
gaataccata cgtactcacg aataagggta gtacctgcca aacagaagaa aatggccgat    240
agccaaataa gagaagccac agcaaatgca acagcaatcc ggaaaaaatc gtccgcaaaa    300
tggtataaac acagacaaaa acaagtccca agaggatcaa taggtcaaaa gaaaaacggc    360
aacgatatag aacaccgaca tgaaggcgcc ttcacctgcg gtagtttcct ttattcaatc    420
tttctctccg atgcaatcat ggaccgaagc cgac                                454
```

(2) INFORMATION FOR SEQ ID NO:23

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 685 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...685

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:23

```
gccgtctggt tgaaaagggc aagatgtctg ccgatgagca gcaagccgta tggctcgtat    60
ccgtacgacg atggacttca atgacctgaa agatgccgta tcgtgattga agcgattgcc   120
gaagaaatgg aaataaagaa acaggcctca gtgctgtggc ggaagtggta agcgagcaat   180
gtatcatcgc taccaaacat cttcattgag tatcacagct ttggcaaccc gaactcccta   240
ccccactcgt gtgatcggaa tgcacttctt caatcccgtt cccgtgatga aactgtagaa   300
gttatcagtg cccagcaaac ttcggacgaa gtgatgaagc aggactggac ttgtgcgaaa   360
tgctcaagaa aacagccgta cgcgtgaacg aactccgggt ttcgtcgtaa accgtcttct   420
cataccgatg atcaacgaag gatcggagcc tatgcccgac ggtgtggcca gcatagagga   480
aatagatcag ccatgatgct cggtgccaat cacccgatgg gccctttggc tttgggcgat   540
ttatcggttt ggatgtctgt ctggctatca tggaggtatt attcaccgat tggtgatgcc   600
aaatatcgtc ctcatccttt gcttcgcaag atggtcggca ggacagcttg gccgaagacc   660
ggcaaagctt ctacgactat agcaa                                         685
```

(2) INFORMATION FOR SEQ ID NO:24

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 3273 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...3273

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:24

```
acaccgctgg aaagcatcgc tttcggtatt ccgacggtga cgaccgacct tcgggcttcg    60
```

```
gcctttgggc tatgcaggag cgcggtagtc ggaacgactc agtacgggcg tagccgtcat    120
caagcgtacc gacgacaatt atgcagagcc gtacaagcca tcgctgacct gctatatcgt    180
tggccggccg aaagtaagac agaacagcct gccggctggc agccatgcaa acggcatccc    240
atgcaagtgg cgtttgtttt acaaccggta tgaagaagca tactctgaat tgctagtcga    300
gattgaaaac aaccgataat gaaaaaaacg catctttgta gtcattccac gaacaaacag    360
ctattataaa acaatgatat tgaacatact gctctaatta tcggattggc tttagtcgtt    420
ggcggagcca attttctcac catggcgcag cctccatagc caagcgattt cgactatcgg    480
atttggtcat ggccttaccg tactggcctt cggcacatcg gctcccgaac tcaccgtcat    540
ctgatggcag ccctgaaagg aagtgccgat atagctatcg gcaacgtctc gggagcaata    600
tctttaacat tctggccatc gttggcatta cggctctatc atgccgctga ccatgtcgaa    660
cagtacgatt cgtatcgaaa tccctcaacc attctctcct ccgcggtctt gtttttcatg    720
gccaacgacc gcctctcgac atggccggag agaatgtgat cacccgtacc gaaggtttcg    780
tattctggct ttcttcctga tatttctatt ctacactttc aatatgtcca aagggaagaa    840
tcccccgggc aagtgaggca gtttgcccta cccctatcca tataatggta ataggcggtc    900
tggtagctct cgtcttcggg ggcgatctgt tgtggacaat gcagctatgc ttgccggacg    960
catgggagta agcgaatcgg tgtcgccatc accatcgtag caggaggaac ttccttgccc   1020
gaattggtcc caccttaatg gctggcatca aagaagcgtc cgggcatggc catcggcata   1080
tcgtaggtag caacctcttc aacatcctgc tcatcctcgg agtcagtcgt ccatcagccc   1140
catacggatc caaggcatta cggtcgtgga ctatggattt tcattctatc ggcaatcctg   1200
ctctacgttt tcggcctttt cttcgagaca aaacgatcaa acgcttcgaa ggcagcatcc   1260
tcttatcgct cttctatgct atacggtcta tttggtcatg accgcctaaa gaaagccata   1320
cgggaaaaat gcgcaagaaa aggctcgacg ccattcgccg gcatattctg cgagcgaaat   1380
ctccacccaa gaggaactgc aaacagcctt gctgtccgaa gcattcccgt atcgcaggcc   1440
acactttcac gcgatctgga aatcctcggc tagaaaaatc ggcctcgcct tcaggggaaa   1500
aagtgtacat cctgcctcgg acaatcgtcc accctcctct cgcggtgaac ttcgtatcgg   1560
acgcaccgag ggtttatcgg accggtcgat acaggagaga tgcttctgct caatacgctg   1620
agggccatgc agcccgtatc gcatcggaaa tagaggagct gtctgccccg aagtggcgga   1680
cgtattcttc ggcccgacgc acatcgttgt catcggcaga aaggaaccac acgtcaggct   1740
ttactctgcg ccattgctcc ggccttcccg aagtcctccg ctgaaaaccg acacacctcc   1800
tctcggcaaa cctaccaaac ttcctacact gtatagtcac gaagactgaa cgacaatgag   1860
tgtgacagga acgacatttc catgagatcg aacgaatcaa caagtatttg cctctctcaa   1920
aagactattc ccctcgcata tcaaaaacac atcactacaa caaacttaaa cgggagcatt   1980
ttgaggcggt tgtcccctga ggtctattgt taatttcatc tatgcagcaa tatttttaca   2040
tatctttgtc gcgtttcatt gaacatcttc aaagaacaca ttccgacacc tttggacatt   2100
acatactcta ctatgatcct ctaaacggta tacaatctca atccaattag cctcctgtct   2160
acgaatgtta cttataaatc aaagtcatta gcaatacaaa aaaatctatg atcgaccttt   2220
tttcaaaatt acgcaactcg gattgcagtc ttcgcagaat gcctctaaca cctatgtcca   2280
ccgcctgctg agccgcagct atcgctgttt ttcctggcct ttttacagct tattgtcaat   2340
gaatcctatc gcgagtattg gtctcttgga atatggaggt tcgatttgcg gatattctga   2400
tgccccgatt gtttggagct tggtcgttta tttattactt gcagccatcc gagccgtcgg   2460
ttatatcgag gcattatgtg gcccgtgatc ctgatcgcac gcttatgtac gtagtcgaga   2520
tgtacctgct caggtgctac gggactgttt tatcccctat atagctactg catttcttgc   2580
tactacatca gccgaggcag tgcattctgg cgagaggctt tctcttggag cgatattggt   2640
catgtccagg ttggtatgcg atcgtttggc ttgtgagtct aaccctcggt cggctctaca   2700
tctactccca agcagaccta aatttctctt tcctctactg cttcgtttct tagcccaata   2760
ctctatgcag cagtttggca ctatcccaaa gctttgatca gctctccgaa gatagaggct   2820
atgctttctc ctatccgaca gcgcaccttg tgagaggttg gtatggagca tctcgcaaag   2880
cttgatggaa gcaaagagat caatgccctt ttcgatcgca ttaactccag tacaaagaga   2940
atatggttac caaagtctcc cctaaagcgc cacacacggt agtgctcgtc tgggtgagtc   3000
agcccgacct gattatatgc atagctatgg ttatcctcgg agaatacccc ccgattggat   3060
agtctgcttg catccggtgc tgctgtaaat tcgacgatgt ggtcagtgcc aagcctaata   3120
ctcaaggttc gattgcgcga tgatgtctat tggagaaagc cgtgcaggag gaaaatggta   3180
tgacgtccta tgctgatacc gctactccgc tccgccggtt actatacctt ctggtgagtg   3240
ctcaggaaaa actgggcttt gcagtgcaaa atg                                  3273
```

(2) INFORMATION FOR SEQ ID NO:25

    (i) SEQUENCE CHARACTERISTICS:
       (A) LENGTH: 646 base pairs
       (B) TYPE: nucleic acid
       (C) STRANDEDNESS: double
       (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

(iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
    (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...646

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:25

```
ggacttatgt gttgaacgaa agcttcgata cgcaaacgct tcctaacggt ggacaatgat      60
cgatgctgat ggtgatggtc acaattggct atctacaaaa acgtttacaa cactgctact     120
catacaggtg acggtgctat gtttagcaat catggacagc tagcagtggt gcaaaaattg     180
atttgagtcc tgacaatatt tggtaactcc taagtttacg gttcctgaga atggtaaact     240
ttctttttggg tttcatctca agagccttgg actaatgagc attatggagt gttctgtcca     300
caaccggaaa cgaggctgca aactttacga taaagctgct ggagaaaccc tcggatccgg     360
caaacctgct ccgatgaact tggtgaagag tgaggagtaa aggctccggc accttatcag     420
gaaagaacca tcgatctctc tcctatgccg gacaacaggt gtacttggca ttccgtcatt     480
tcggctgtac ggtatattcc gtctttatct tgatgacgtg gctgtttctg gtgaaggttt     540
tccaacgact acacgtacac ggtatatcgt gacaatgttg ttatcgccag aatctcacgg     600
caacgacatt caatcaggaa aatgtagctc cggccagaca actact                    646
```

(2) INFORMATION FOR SEQ ID NO:26

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 574 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...574

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:26

```
cggcaacgct tttcatcgta ttagggacgc tgaccaaact gtatggtatg ttggcttggc      60
tttcttcccg tttgtgaaaa gaaaaggccg ctatttggtt ggcttttgc atggttcggt      120
ctgatcggta tcttgccgat gttgtttgag gaggttctta tgcccttgag cagtatatga     180
attggtttgc tagcctggca cgaagaatgg ggagaatctg ttctccctgt atcaaaacgt     240
ttcccgctcg ggatggttag gaaaatgacc ggtattgccg gctactccga cttgtgttgt     300
tagtccccgg acttatccta ttcgctcttc ctttcctccg attagtcagt acaaggctcc     360
actctttcgg atgagcatat tggcttcgac tcgctttca ccgtttttatt cagtaccggt     420
agcgaatcga gtacttatat ctagcgttgt tgggtgtcgg tatctggttc atacatcgcc     480
ccaaagggaa cccgaccggc tggatattac actcttagtc ggaacactat tcctctcctt     540
ttatcgccga ccgatctgtc cctgcggctc ttcg                                  574
```

(2) INFORMATION FOR SEQ ID NO:27

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 1057 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

(iii) HYPOTHETICAL: NO

(iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
    (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...1057

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:27

```
gactctaccg cgaaactata gacttttacc ccattcatat cgtataaaga gcttcctgcc      60
ctaaaagaga ctcggggatc tcgacgagcg catatcttct accggattgg gatatatcct     120
gacagtggga gcatctactg ccaagttgat gtcggacttc cttcgtatgg aagcatattg     180
tcagaatcac cgttgagtca aatactcgcc agttcttact tttagctttt tccacatcct     240
ttacgtacag atattcttct catcagtgtc cttgaggtgt tcnaaacgac gaaattgctc     300
tgagcgcctg cgccgggaga tagtgtgggc aaagcattca ccatttcgtc atttcttcac     360
ctgcgatctg attggaatga caaaccaaaa catcagtccc ttcacccccg acagattcaa     420
ggatgtaagt ttgttcgatg acaccaaagg taagcaacgt ccgaattctt ggaaagatcc     480
aaggtcgaaa ctcattgtca ctgcaccaaa gtgttaccaa tagaggattg gcactcagac     540
gagtttcgtg atccgattac cgaagcacca aagatcattg agacgaggtt ggcactgagt     600
tccaactccg tcaggttatt atcagaacac caaagagggc caacttgggg ttgttatcgg     660
tcttcagctc agtcagctta ttcctgcaca gccgaggatg atcaaagccg gattgccact     720
caaggcccaa ccttcattcg ttagagtcgc accaaactcg cagcagcttt gggtttttgcg    780
tcaatccaat gatttcagat tatttttcgg gcatgcgaga taggtcagat taggttttttc    840
gttacatcga cagccgttgc accggtagat cgacagccca atgggtcgta ttaccataga     900
tagtgagggt ttgcgtcccg atcgtgtatt ctggtatgcc tcatcgaata cnggtattcc     960
tctccttgtn ggtaagtggc tccccattga gatcgatcca gatgcctttc ttctctatgg    1020
aatgaaccac aattcgattt tttcgcctac ggccttg                            1057
```

(2) INFORMATION FOR SEQ ID NO:28

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 2349 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...2349

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:28

```
ctttgggctt caaaaagata cgaggaccta tctgtaggta tatttatcct gttttttcttg     60
ttttattgag tggtagtacc tatttttgtg atgagagtgg actctcgtca tgtcgattaa     120
aaagaaaaca gaaatgaata agagtataaa ggctcaaaga cagaaaagca tttgctcatg     180
gcatttgccg gagaatgcaa gctcggtcgc gctatacttt ctttgcaagt gttgccaaga     240
aagaggttat gaacaaattg ccggagtttt catggaaacc gctgagcagg aaaagagcat     300
gccaaaaggt ttttctcttt cttggaaggc ggcatgcttg agaaacggct tctttttcctg     360
caggaataat cggttccacg gctgagaact tggcgcggcg gntgccggtg aaaatgaaga     420
gtggacagat ctctatccgg ctttgctgaa acagccgaag aagagggatt taaggagatt     480
gcagccgtat tcgtcagata gcaaaggtgg aagccgagca tgaacgtcgc tatctggctt     540
tttggctcat gtggaagatg gatcggtctt cgagcgaacg gaagaaatgc atggcaatgt     600
cgcaattgcg gctatgtcat tacttccaag aaagctcgaa gctatgtccc gcttgcgctc     660
```

```
atccgcaggc ttacttcgag ccaatgaaac gaattactga ggatcacatt catatagaaa    720
cgaagtaatt atctgtctca tgttttttgaa ggaggcaccg ctcgggagag tcgtgcctct    780
ttttgctctg ttattccctg cgaaaagcgt gtgcgtcatt ttgttttttc gaacaagtat    840
agagaccggt cctgtaaagt gggactctca cggttttttcc ggcatacagc cggattgaaa    900
agtgctaatc cgatgaaaaa accgtacttt tgccgaaatt acttaataac caaacaagta    960
acctaagata cttatggaat gaaaagattt ttatcacttg gtcttctgct tgtgggattc   1020
attccgatga gctttctgcc caacaggctc agccactccc tacagatccg gctgttcggt   1080
cggtaagttg gacaacggat tgacttattt catccgtcac aacgagaccc gaaagatcgt   1140
gcggatttct ttatcgcaca aaaggtaggt tctattttga agaagatagc cagtccggtt   1200
tggctcactt cttggaacac atggcttcaa cggtacgaag aacttccccg gtaagaactt   1260
gatcaactat ctcgaacgat cggtgtacgt ttcggtcaga acctgaacgc ttctaccgga   1320
ttacaagac ggaatatacg ataatggatg tgccgactac acgtcaggga atatcgactc   1380
ctgcttgctt atcctgcatg attggagtaa caatattacc ccgacgggca tgagatcgac   1440
gaggagcgcg gtgtgatcca ggaagagtgg gtgctcgtcg cgatgccaac cttcgtatgt   1500
tcgaggctat acttgccaag ctatgccggg taataaatat gcagaacgca tgcccatcgg   1560
tctgatggcg tcgtgctcaa cttcaagcat gatgagctgc gcaactatta taagaaaggt   1620
atcgtcccga cctgcaaggt ctggtgatcg tgggagatat cgatgtgact atgtggagaa   1680
caagatcaaa gaactcttca aggacgttcc tgctccgtga atccagcaga gcgtatctat   1740
acgccggtag aggacaacga tgagctatcg tagccattgc taccgatgct gaggctacta   1800
ccacgcagct ctcatcagct tcaagagcga ccccactcct caagaagtgc gaggatcgat   1860
atcggacttg tggaagacta tatgaaacag gtgatcacta cagccgtgaa tagcgtctgt   1920
ccgagattac tcacaagcct aacgctcctt tcctcagtgc ggagctttct tctctaactt   1980
catgtacatc acccagacta aggacgcatc aattttgttg cctcggttcg tgagggtgaa   2040
gcggagaaag cgatgaacca ttggtggcag agatagaaag cctccgtcag ttcggtattc   2100
accaaagcga atacggatcg tgcacggcnc gaatgtgctc aagcgatacg agaatcatac   2160
aacgaaagag acaagcgtaa gaacaatgct tatgccaatg aatacccacc tacttcaccg   2220
atggcggcta tatcccgggt attgaggtgg aatacagacg gtgaatgctt ttgctcctca   2280
ggttcctctg gaagcattca atcggctatt gcccaaatga tcgatccggt gaagaatgct   2340
gtcgttacc                                                           2349
```

(2) INFORMATION FOR SEQ ID NO:29

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 671 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...671

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:29

```
gcaaacctcc gacaaagaac tgcatctgca caatgtgaaa ctggctatgc aagggtggag    60
cgacatagct ccattaccct cagttcgcct ttccttgagg agcactgcat ggcgagttca   120
cattgtccaa gctgccttcg atgctcgagg agtggttggc gcacatcttc ctgcacttgc   180
gggccatagg tcgcagcaag agtgccgact gaggatgtcc gtctgcgttt ggcgttggac   240
ggctcttgcc caaggaagtg tgcagcttct tccggttgcc tttggccgaa gcggttctat   300
caagatcagg gcagcctatt ccgaattgct tcgaagcctc gattgcacat tcgtaccgac   360
aggctcatga ctatgaacaa agagctacgg gaacggaggt gaccttgaac tcatccaccg   420
gcaaggccga actcatctgt cgtccgactt gtatgtgaat ggcgatgcca cgacacgaga   480
cctcaacctg aagcatcagt ggcaaacgac agcatccgtg cccgactgga tatgggacag   540
acaagcgagg agcgaaaaac ggatttatat cgctgctcac aaacttcctc gggacgagga   600
ctcatcgctg aatactcata tcggtctcga tcgctctcgg cacgcatcgg cggtatgagt   660
ggcagatagc c                                                        671
```

(2) INFORMATION FOR SEQ ID NO:30

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 724 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...724

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:30

```
ccgaatccaa agtctcaagc tctgcaatga ttgctttctt gctcttcagt tttcgcattc    60
ttcggagcgc atatctccct gttcggcttt tttacgttga agaatgcatc gcatgcagtc   120
gtaaaacgct tccatatctc atcactaacc gatgaggaac ggctccgatg gtttttccatt   180
tcttttggag ttcggcaagc gagtagaggt ttctttccag tcggaactct cctgaaggct   240
ctccgttctt ctaccatggc cagcttcttc ttgtagttat cggtcagctc ttcagtttgc   300
ctttgaagaa agctgttttc ttattgaaat aatcgtcaca tgcgcgcgga aacgctcgta   360
gatcttctca ttgtcgcttc tgcgagcata gctatagtct tccacttggc ctgaatctct   420
agtacggcct tcgtttgctc gcccatttgg ccagcgagtt cagaccggag gtatctatcg   480
cttccatttc tcacaaagca atgttttcgc agccagattc tcctgctcgc gcatcttttc   540
ttttcgaagt gttcctgata cttcttattg atagcaagta gaagcagctt gaatctcgcc   600
cacacctctt cgcggagttc gcgagctacc ggtcccattc gcgccattga tgatgcagtc   660
ttgcagtacc ctgaaagaat ggatgaatcc gcattctcag tcagcacttc ggcctgatgg   720
atca                                                               724
```

(2) INFORMATION FOR SEQ ID NO:31

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 2863 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...2863

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:31

```
attgttttgt gtgtttatgg tatgatcaat gacacaaaat gatggcacgc aaggaaaatc    60
atccaacgag aagaggtctc attcagggac gtcatgtcac gaatcgatac aggaaagccc   120
ggaatgtatt tttgacccaa gtcgatagct tacatgagag gatactatgg tctcctatga   180
gaggatacta tggtctacac gagaggatac tatggtctca tacgagagga tactatggtc   240
tcacaaagag gatactatgg tctcacatga gagaatacta tggtctccta tgagggatac   300
tatggtctta cacgagagga tactatggtc tcatatgaga ggaactatgc tctcacatga   360
gaggatacta tggtcttaca cgagaggata cttggtctca tatgagagga tattatggtc   420
```

```
tcacatgaga ggatactatg actattgatg gaagatgcta tctgctctgt gtcggatggc    480
aggttcgggg gtgggaggtt ccgtgcgagc tgttaaaccg atagatgaga ttgtcacacg    540
cattttccgg gagatttcgt tgtcaattga ctgtttttca gtgtctgtta tagacataaa    600
gtatcaaatc aagagtcgtt tgcttggctt gtcgggctat gaatttgtcc tgaataaata    660
gaacagggtg aagagaaggg tgagccattg gggtgtagct cgcaatgagg gaaaagcaaa    720
tgtcgtggtc agccttggca gagcgttcgg cgatggctgt ctcttctatg atacttcgag    780
ccattccaca ccttgtgaga tacgatgtgc catacctatt cccccatgca tatgccaccc    840
aaatgcaagc ccggccagcg catttccatc cgccggatga tgcctgccga agttccgtat    900
cggcgtagta ttgcggtatg gcatggcggt gcgtgagatg tgcagcagat ccggcttaca    960
ggtgtgaggt atgcgcagca atcgcgtagc tcttccattg caatcgtgct gatctcctcg   1020
tcggaaaggc tatgagcgaa gcatttcgca ccccacccat gaatatggaa tagagtgccc   1080
cccttcaggt gctctgccac ggaaacagtc cgaagggaac aggatgcgag gatgcgacga   1140
ttttccctcg aagggatcag gcacccgaaa gccggcggtg tgtggcaaca tttcggcgga   1200
accctacggc aacctctatc atggggcata atagagctgc tcgaacacgg ctgattcatc   1260
cgcagggaag tggtgaacag tgtgggggata tggtgcgctg ccaccgtact caccaagtgg   1320
cggaaggaat ggtgtgctcc tcttccgaag catccgtata ggtaaggccg aagtgtgtgc   1380
tcccgggtga ttgatgtatc ggatttgcgt ttccgtcagg agtgttcgcg tccgatgtag   1440
tcggccaaag cttcgaccag aagaccgagt ccccttgtac ggaaaagacc ttgcgcgagg   1500
ctttgcggtc gcgttcgctt gcggctgtcg ggcttttcga acggcaccca gtacgaagct   1560
gccgtatcct gctccagatc gtatagtttg ggcagggcaa agcgagtaac cagttggcgg   1620
gatctcctgc ataaatacct ccgaggaaag gatcgactgc gtagtcacaa aacttttgcc   1680
cagccggcga cgagccaagg ctccgaccgt ctcatgggtt gtccgcctct ccggcggaag   1740
ggttcgccga ggatacgcca tttgcccaca gggaaaagag aggagtagcg actgcctcgg   1800
cgatgttcct tggagggggat acagtttgtt gcctttccat atcagacggt tagaggccgc   1860
agagtggcta tctcaggttc caatccgagc agttcgaata gctcggccac tccggagagg   1920
agatcgtgcc ggtattcggc cctgtctcga acacgaaccc tcctctctgt aggtgcgtat   1980
ctgtccgccg atatgagcag ctcgctccaa ccagaacagg cctgccggca agctctgagg   2040
aaagcggctg tggtcagtcg gtgagcccgg ctcctatgat gacggtcaga tgatccatga   2100
atcaggctcc ccaccttcaa aggcaagagc atagaaacgc atctgcttga gcatgggacg   2160
aggccgttgg agcgtgtcgg cgagagatga tcttgcaacc ctactccgga atgaagtaga   2220
gatcggacga aacgatgtct ttcggttttct ggtcttcagt atccgtagta gcagagccac   2280
tatccctttg acgatgaggg catgctatcg gcgcggtagt gcaccttgcc atcttgcagg   2340
gaggctgcta tcatacgcga ctctggcaac cttcgataat gttctccggc accttatctg   2400
cgcatccagt tcgggtaggg cactgcccat atcgatcagc agttgataac atccatccaa   2460
tcatcgaaag cggagaattc ctcgatgatc tgatcctgtt ttcgtttata cttggcatgg   2520
gataagctaa tgagtgaata gtcagtgtaa gcggctttca cctgttcgtc caaatatcga   2580
atgacggttt cgcccacgca tcgagtacat ttttgtcgat gatctgcata ttgtccctct   2640
gggtatccag tggtcgccga agccatgttc gttcttggac gagtaattga taatacgatg   2700
caagggatcc ctaaattctt gatcacaggt acatgatcat ctgtagagcg cctccgtcgg   2760
cttggatgaa gtagttgcca tatcctaatg cggtgccgtc tgccatacgg cagagatcaa   2820
ccccggggca tagctcttgg agagtactcc caatagaatg tag       .            2863
```

(2) INFORMATION FOR SEQ ID NO:32

        (i) SEQUENCE CHARACTERISTICS:
             (A) LENGTH: 629 base pairs
             (B) TYPE: nucleic acid
             (C) STRANDEDNESS: double
             (D) TOPOLOGY: circular

       (ii) MOLECULE TYPE: DNA (genomic)

      (iii) HYPOTHETICAL: NO

       (iv) ANTI-SENSE: UNKNOWN

       (vi) ORIGINAL SOURCE:
             (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

       (ix) FEATURE:
             (A) NAME/KEY: misc_feature
             (B) LOCATION 1...629

       (xi) SEQUENCE DESCRIPTION: SEQ ID NO:32

```
aaagtccaag gaagagttgt ctgctttttct cggctgtgag catatcgagg ctgcaaatgc    60
ttcgtcaagc aggagcaatt gcgggcgttg gagaaatatc gtgccagtgc cacacgctga   120
```

```
cgttgccctc cgcttagatc cttcggaacc gatgcaatat gtccgacaag ccgagggtgt      180
gtacaatgct ctcaaatccg gcatctctat ggcttccttt cgcagggtat atggaagtac      240
gatatctcat gcactcgttt ccatggcaaa agcccatatt gctggggaac tattctatgg      300
aaaaagattt cggattcaga ggtttcccat cgaatagcac ttcccctcat actctgtcag      360
tacacctgcc aaaacgtgca ggagtgttga ttgccacagc ccgaaggtcc cgttatggca      420
aaaatctctc ctttgggaat atcagtgaaa gaccgtccaa tgctttcact tccgtactcc      480
cgtggcgata gtaacggcca gattgcgaat agagatcatt tgcctaatgg aggaatctgg      540
tttcgtccgt ctcttgatta tgccggactt tacggatcag atccttgcgg ttagtcgctc      600
gggaccaatt tcttggcatg tacccagtc                                        629
```

(2) INFORMATION FOR SEQ ID NO:33

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 581 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...581

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:33

```
tacaaactgg acgttgtagt tattccgaca aacaagccta tcgcccgtag gatatgaatg       60
atcgtatcta taagacggca cgtgaaaaat atgcagcatt atcgaagaga ttgtacgtct      120
tgtcgaagag ggcagacctg tacttgtggt actacttcgg tggaaatatc cgaattgttg      180
agccgtatgt tacgctgcgt ggcatccaac cacaaatgta ctcaatgcca aattgcatca      240
gaaggggccg agattgtagc tcaggccggt cagaaaggaa ctgttaccat cgcacgaaca      300
tggccggtcg tggtaccnac atcaagctct ctgccgaggt taaaaagccg ggggtatggc      360
tatcattggt acggaaaggc acgaatccag acagtggaca gacagcttcg tggtcgttcc      420
ggccgtcagg gtgatcccgg tcgtccatat tctatgtttc ccttgaagat catctgatgc      480
gcctctttgc acagaaaaga ttgcattatt gatggatcgt ttaggtttca aggaaggaga      540
gtgctcgaaa actacatgct nagtaagtcc gtggagcgtg c                          581
```

(2) INFORMATION FOR SEQ ID NO:34

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 633 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...633

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:34

```
gtgctgatga cgttagccgt ttactcattt atgcctctga tccggacgaa cagatctcat      60
tgtgacgcga gtgttcgatc gcctttcgga aacactctcg tcgggaaca acgactgacc      120
atcaatacgg ctacagaact gaatccgtga ttatggattg gctctctgcc ttggacacca      180
atgttgctat cctgctacac tgatgggatt ggtcggaggc ttcacgatga tagcccggtc      240
tgatttttg gtcatggaca aaacgcagtt tatcggcatg ctcaaagctt taggtgtgct      300
gaagggtcgc ttcgccgcat attcctctat ctggctatga tgccgttggt cgtggtatga      360
tctggggcaa tgttttggct cttatactct gctcctgcag caacatttcc gctggttgcg      420
tctccttcga tcctgatatt tctacatgga ctatgtgcct gttcaagtgg actggctcgt      480
atggattctc ttaatttggg taccctcctc gttaccttct tgatgctcct tgctccatcc      540
atattatttc gagaatttcc cccgtcaaag cccttcgctt cgagtaatgc ttcaccaggg      600
aatagggtag gtcatctgtc cattcgagac cat                                  633
```

(2) INFORMATION FOR SEQ ID NO:35

      (i) SEQUENCE CHARACTERISTICS:
          (A) LENGTH: 4047 base pairs
          (B) TYPE: nucleic acid
          (C) STRANDEDNESS: double
          (D) TOPOLOGY: circular

      (ii) MOLECULE TYPE: DNA (genomic)

     (iii) HYPOTHETICAL: NO

      (iv) ANTI-SENSE: UNKNOWN

      (vi) ORIGINAL SOURCE:
          (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

      (ix) FEATURE:
          (A) NAME/KEY: misc_feature
          (B) LOCATION 1...4047

      (xi) SEQUENCE DESCRIPTION: SEQ ID NO:35

```
ggcaacgtcc tccgcagtgc cgaaaacacc tgcattgccc gatataccctc gaggcatgca      60
gcagcttcgt cgtccacggt accgcggacg atgctttcg tagaaatttg tcgttctgtg      120
ccggtgcaat gcgcgaaacg gaatattatc gagtggaaga taaccgagcg aaccggctcc      180
gatggggcgg aatatagttc ttcgacaaag acgttcaagc tcttgcccga tactttttcc      240
acaattgctg tagcaggata aaccccagat ccgaatactt gtagcgtccg actcattgcg      300
aggggtagaa gcgatggtat tgaggacaat ttctttgacc tcttcgatag atacagattg      360
gaagaaaaac gaaacggata gtccggccga aatgcccgga aaccaaatcg gagcgaaatc      420
cgaagaatgg attgccccac aattggtatc tactcgaacc catcccgaac tccgccgggg      480
agagagcaac tgccgtccaa actgctactg tctatcagag attcgtagaa attgatcgag      540
gccgaaggcc tgcttcatga agtagaagct gctgtacggt gatgtcttga ggtctgttcg      600
ggcaaaacga ggcaatagcg ttccgagccg gtcggaggct tcaattttcc atcctgaacc      660
aatagcatca cagccggagt agtggcacga ccttggtgac ggatgccaag tcgtagatgg      720
tggaagaaga cacctgcctc cacgtgccga tccgtcgaga gtgccgaagc ttttgtcata      780
tacccccttgt ctcgatggac agcgaggata cgacaaccgg ggaaagcccc ttgcttaggg      840
cttctttcgc tatgcggtct accgccggca tcgggatgag gcggacgaca attcggtcgg      900
cggcatcatg ttcgctgtcg gatcaagtgt ctcctcttcc tgaacgaccg ggatcccacc      960
gcccgaggat accacaactc gtcccgaatc ttggaggctg ccattcgagc agcctccttt      1020
acgtttcatt gccacgacta tagcccgagc tttgtccata gccgccggaa tcctatcgct      1080
acataggcg atgtgaagaa gacgatggca gtgtggtttt gttccgtagc cggtggagaa      1140
acgttcctgc ccagtccggc tgtgtatgtc gaactggacg atcacagcat cgtaccccctt      1200
gagtttggag agcaactctt gtgtagtgta ctgttgctgc ccttggcata ggaatagcag      1260
tccttgctcg taagcccagc tcttgtgtaa aagtattgga ggctgcacca tctagattga      1320
cgctgcaata cggtttccct ccgagagggg gaggaagtgc ttcttgtttt tggaatcgta      1380
atggatgcct gccaaagatc ttccgacatc cgttccgctt ccggctgttt acctgtcgta      1440
ccacttcctc tgccggtagc tccttggata tcccttacaa atgatgagcg catacttgaa      1500
ggccagaatt ttgcgacatt ctcgtccagc aattctttgc ttatcgttct gtcttccact      1560
gcggccagac ctcggagaaa gtcttgaccg ggtccaccgg accgaggagg atgtcatgcc      1620
ggccaatatg gcacggacgg agatcggttg agaaccggct gtctgtctcc ctgcatggcc      1680
agtccgtccg taaagatcag cccccttgaaa cccattcctg ccaaagcaga tcggtgcaga      1740
tggcatgact gagggaggag ggcgattttt ctttgcttcc aaagccggaa cattgaggtg      1800
agcggtcatc actcgctgag gccggctcgg aaaaactcct tgaaggggaa caattcagta      1860
```

```
tttccaattc ctctcgggag gcaaagaccg tgggcaaggt cttgtgcgag tctctgtggt    1920
attgccgtgt ccggggaaat gcttggccac ggccatcact ctccgtcctc caatccttgt    1980
gcataggcaa tccctctttc tgctactcgc gtgggttgtc gccgaagctg cgcgtgccga    2040
taacagggtt cttcggatgt tgttcacgtc cagcaccgga gcaaaattga tatgaatccc    2100
catcagcggc attggcgcgc tacctcccga ccatagttgt agaggagctg attgtctttt    2160
ggtgtcccaa gcccatattg cgagggaagc gtggggcatc tttcaacgca tgtgcaaacc    2220
ccactcaccg tccagtgcta tgaggagagg ggtgcggctg cttcctgcaa gcggcgagtc    2280
atcgtgtatt gctccgagag tgtccctttt ggaagagtat gcccccgatg tggcaggtgc    2340
gcaccagctg ttggcttgct ttactttttc ttcctgtaaa gagggataga cgatcggcat    2400
ggcagctggc ctactttttc ctccgtgctc atagccttca tgcggtcgtc acccagcgtt    2460
tgacatcttt gctctcgact cccccgaaga ggagaaagga tagtctttgg actgctgggc    2520
atgcatggca cccatgttcg tgcgggccgt gccgtagctg tgtacagcac cgagagagag    2580
agtattgtga tggcggaaaa agaaatcgtt tcatacccta caaatgtaca taaaaatggt    2640
ggccgatccg agccttccct tctacaagaa aaaggaagga gacggacaaa agaagtttgc    2700
ttccgttgtc gtctccttcg ctcgaaagag agtaaaaggt agagaagttg ttatgcttgt    2760
tcttgtacga tgatctcgcc atcgcgagca gaggcgtaag cgtctgccct ttctcgatct    2820
gtccggagag gataagatcc gtaggcgatc ctccacttcg ttctggagtg tgcgcttgag    2880
cggtcgtgct cgtattggag gtcgtatccc ttcgtcgcta tcacatcctt ggcttcatcg    2940
taaggacgag gtcgtatccg gcacgatgga tgcgcgccaa gacggcttta gctctatgtc    3000
caccatccgg cgaatctccg tcttgcccag ttggtcgaga ggatgatatc gtccaaacgg    3060
ttgagaaatt cggggctgaa cgtcttgtca gagctttttg gatcacggaa cggctatgct    3120
ccttgttcgc ttcctctctt tttccgaacg gaacccgata ccctgcccga agtctttgag    3180
ctggctgtac ccacgttgga ggtgatgatg atcacggtgt tcttgaaatt cacggccgtc    3240
ccagactgtc ggtcagctga ccttcgtcca tcacctgtaa gagagattga agacatcggc    3300
atgcgccttt tcgatctcat ccaagagaac caggaatagg gtttgcgtct tacgcgctcc    3360
gtcagttggc cgccttcttc aagcccacat atcccggagg ggcacccacg agacgcgaaa    3420
cggagaactt tccatatact cgctcatatc caccctgatc atggcattct catcctcgac    3480
aggtattcgg cgagcttctt ggccaaatag gtcttgccta cccccgtggg ccgaggaaaa    3540
ggaaagaacc gatcggtttc ttttcattgc gaagtccaga cgattgcgct ggatggcatg    3600
caccatcttt tcgatggctg tgtcctacct actactttgg tcttgagatc atctgccatc    3660
gtgcgcagac gttcgcttcg cccgtgctca gccgctcagc cggaacgcct gtcatcaacg    3720
ccacacatgc gccactacat tctcgtccac cgtctcgcgg tgcttggaca tctctcttcc    3780
cattttttct tctcttccgc tatctgctgc tgagtgcgcc gccctgatcg cggaaggagg    3840
cagccagttc gtagttctga gcctttacgg cgagagcttg ttctctcgca ccgatgccaa    3900
ttcggcctcc agtatctcga ttctttcgga gccaccacat tggtgatatg gacgctcgcg    3960
ccggcctcgc catggcatct atcgccttat ctgggaagaa acgatcggat acatagcgtc    4020
ggtcagttcc actgccgctt tgatcgc                                         4047
```

(2) INFORMATION FOR SEQ ID NO:36

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 751 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...751

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:36

```
gtgtttttgg cgataaggtc tgaccttgaa aaaaaggatt ctcaaattgt caatatattt     60
tcctctatgt cttatcgatt ctgatatata acacaacttt tcttttgaag tgggtatcag    120
gcttatgttc tatccttta tgttcatttc atattgatcc ctaatgctta tgtattgtca    180
gataaaatat ggcaaaaggt gtgattttgg ctattttggt tgtgttctca ttctttatgc    240
ttaagatctc agcagtccag ctgaaccata cgctaactat aagtctatac tctttgaaaa    300
atactgttta gagaattatg atcgtgcatt ctcccttggt caggtgctta ttcctccata    360
```

```
caacgtggag aaatcagaaa tcgagtctga tttgaaatag cctacttgaa tgtagctaaa    420
atgttttatg acaaagctcc cgcaatcaat ataagacgat aagggaatac aggccactga    480
atccgaagag atcgcctcca tgcaatacca ttcgttaatc cgatttaggt ttgcttgtca    540
ttgtcagact cttctgttct gagatattta ggatattttc tgtgtaaaca gaacagaaga    600
taaaaagaat gatgagagcc tgactttgtg ttgccacgtc tttttcctac aaagtaattc    660
gacataatat gataaccgtt gcccattgat caataacatt ggccaatcag gaccggggat    720
agtcatgcgc gacatattcg acacatggat c                                   751
```

(2) INFORMATION FOR SEQ ID NO:37

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 911 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...911

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:37

```
aggttctccg tctcacacag atcgatgtgc acagtttggg tgagctgcgg tcaatcaagc    60
actgcgcaat atcgaagctt tctacgaagc tttcaataac agcctactga taagatgtat    120
ttggaacccg aaaagcgtgt agtcgttggt aagctgaccg acactcctat acgggaaaag    180
aggctacgtt ccgaggttat tccttggaac gcagcctctt tcgttagaaa aggaacctaa    240
tcggaaggaa agagcataag gaggggttat aaactcggcc tatcgctcat cagataatga    300
gaccaattcg agggacgctt ggtaacggct gccaccaata cacgatcttg gccgcaaagg    360
cttctgccaa tggctcggcc gcagcttgta cctagccccg gtagtcagca catcgtccac    420
caaaagaaca cggataccgg cacgcgcgta ttcggggaga gggcaaactt ccctttcatg    480
gctgactttc ttccgaatag gactgtccgg tctgactgtc cgtatatacc tttctgcgca    540
accttcttga acaggtattc ccgttacgcg acttaatcct tgtgcgatag gagtgcctga    600
ttgtagccac gcttacgttg tttgcgtggg tgtaaagaac cggcactatc agatcgtaat    660
ccttggacag gaaaggatag gatcggcggc cattcgtccg agcatttcgc cgatctcact    720
gtatcctcca tatttagtgc gtgtatcata ggccttacac ccccgtcctc tttgaaaata    780
aaaagctgta cagcgcgtcg atataaacat ccccattcag acgatctaat ccaattgcat    840
cccttcgata taccgnggca ttctcaccat gcaacgagga caccccgat ctccgtctcg     900
gcgagcaagc t                                                         911
```

(2) INFORMATION FOR SEQ ID NO:38

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 513 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:

```
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...513
```

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:38

```
tgggctgtcg tattccaacg tgccgaaggc gaagtctggg ctgccaccgc catcgctctt    60
ctcagagact ctatttccgt cttgcggcgg acggactcgt atggcagaaa acggttactc   120
actgttcacc gagcgagata gctgggaggt gacgctgttc tcttttttctt gcgttggggt   180
tatacacctg ctgatacaca ttgatccgcg aaatacggaa acttccccc ggccatgccc    240
tacgcataga gtcggagagg gtattacgac cactgcctat gacacagtag accgtatgcc   300
ccgttngaca gccatttttt tatcttatga aggaggntta aagagtnnct gaaccccgc    360
cttattcttg ccggcaagag actcgttcgc tactgaatgg cagatcggcc atacttcccc   420
tttccggagg atttcgactc gggatgatag cctacatgct gcatcgtctg aagtacccac   480
atgtctattt tatctcctat ggcaaagagg aaa                                513
```


(2) INFORMATION FOR SEQ ID NO:39

    (i) SEQUENCE CHARACTERISTICS:
         (A) LENGTH: 711 base pairs
         (B) TYPE: nucleic acid
         (C) STRANDEDNESS: double
         (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
         (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
         (A) NAME/KEY: misc_feature
         (B) LOCATION 1...711

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:39

```
ntccccggcc cacatcgtcc aaacgggcag cagcccttcg ttttgctcac gaaagcgacg    60
agactttctg ccatatcggc tgcacgttcg ggaaaaagat gttgtacaag gggtgggcag   120
ctcggtaggt gtcccagagc gagaaggact gtagtgtttg cgtgccgtct ttagcgtatg   180
gatcttttg tccgctctct gtaacggcca tctgcatcgc tgaaaaccgt cgggcagagc    240
agacttgata gagcgcggta tagaaaatag tgtccactcg gggcgatatt ccttttccgc   300
cactatacgc gacaaggcac gttgccacag cagcgatgct tcccacggta gcggtcgaaa   360
tcgtggtggg gagcttcttt cgccagattg ttgccgctcc cttttcgtcc acgcccgata   420
gggcggtgga gatcgtcagc ggctgtcgga cttggctatt aaaaacgaaa ggtgggctac   480
aaggccgtaa caatgaattg cgtcgtatcg ttattggcat attggggtac actgtctatg   540
tgaactgctc tatcggaaga gaaaatctgc tgcggaagaa tatgcgctat cccgtgccca   600
accgtccgag aagcgataac cgcttatcgt gtggctgcga tcagctgcag acggcttgtc   660
tgtcgtcctg tcccaattca tcgtgcattg agatcgaggc gacttcagta c             711
```


(2) INFORMATION FOR SEQ ID NO:40

    (i) SEQUENCE CHARACTERISTICS:
         (A) LENGTH: 1387 base pairs
         (B) TYPE: nucleic acid
         (C) STRANDEDNESS: double
         (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:

(A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...1387

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:40

```
tatagctcag ctggtttaga gcatctgcct acaagcagag ggtcataggt cgaatcctat    60
tgggcccacc ttttttcaag ccgtgcaagc atcgatgatc ttgtgcggct ttcttgtttt   120
cactttaaaa aaagaagaaa ataccagtga aacggactga ttgttttct ggcaatgggt    180
ggcttgctgt tcaccctgcg aacgcacaag aagcaaacac tgcatctgac actcccaaaa   240
aggacggact ataaaggtg tgaccggact aaatgcctct cagacttctc tgacaactgg    300
gctgccggtg gagaaaacac ggtggcaggt aacctctatt tgacatagat gccaactacc   360
tgaaagataa atggagttgg gacaacggtt tggtacagac ttcggtctga cctacacaac   420
agccaacaag tggaacaaaa ggtagacaag atcgaactct tcacgaaggc cggctatgag   480
atcggcaaac ttggtacgga agtgcgcttt tcactttcct ctcacagtat gccaaaggaa   540
tgagaagccc tcggatcact tgacaggagt caagcatatc tctaattttt cgctcctgca   600
tatctcactc tcggtattgg tgcggactat aagcccatga gaagttctct ctctacctct   660
ctcctacaac gggcaagctg actgtatagc agacgactac ctctcaagtt tgggagcctt   720
cggggtgaaa gttgggaaaa gacaatgttc gaacttggtg ctttggtagt gggttcggcc   780
aataaaatct gatggagaat gtcaatttga taaccaaggc ttcattcttc tcgcttatac   840
gcacgacttt ggcaacattg acatcaattg ggaggctatg ctgccatgaa gatcaacaag   900
ttcctcacgg ctacgatagc caccaatctt actacgacga tgatgtgaag atcaacgatg   960
gcccgaaaat ccagttcaaa aagttgtggg cgtgggtgtt gcgtacactt tctaaataaa  1020
gaatttcaat tctgacaacg aaggctgcgg ctgccgatat gggtggttgc agcctttgtg  1080
tttttgcttg aattaacttc ggtaggggag caagagggca accgcataaa tctttagtag  1140
cttttttgaga tagtctatat tcagagcggc tttgaaaacc tcttccgtaa ggatagtttg  1200
tctttgtgcc cagagacgtt acatcaaatg ggaactctgc acaataagca ggcacttttg  1260
ttcattcttt ttatgtgtgt caggcgacta tttggcacat gccggatttc cacaagtgga  1320
aagtatcttt ccaccattgg aaaataaact ttccactagt ggaaacttct tttccaatgg  1380
tggaaat                                                             1387
```

(2) INFORMATION FOR SEQ ID NO:41

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 796 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...796

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:41

```
atgtacaagt gaacaaaaaa ctcgctcccg atgagtataa gatatggcgg actccgtccg    60
ccgcagtatt gccgaattgg gaactcctat tgcatacgcc aaacgttcaa tgtgtcgtat   120
acgttgccga ctgcccaaat atccgcatga attgggtgaa tggttcattg acttataatg   180
ccgtgtataa ttgggacgtg gagcgaaaac gactaccgaa caaatcattg ggaacacgat   240
ccggatcagg caacgctgga acttcccctg caactcaatc tgacatcgct gtatgcaaat   300
ctgctttcct caagagaata gagcagcaca tcacgaatcc ggaaaaaagg atcctgtaaa   360
aaaagcagcc cagccattga ccaagaaaat ccgttgctcc ccgattccac ggtaacactg   420
acgcacactt ttgcgtccaa gaagtgagag tgtccgctct cggtccggat ggcaagatgt   480
atccgctgaa acaaaaatca aggacaagaa tacaatcgtc attttaaata atgacagcaa   540
gagatcaatg taacggtaac tcccccgagg cagaacggct ccattcctca ttcggtgcga   600
taggcgaaag gatggtatac gccttgatga tgctcaaagc atcaacctta actaccggca   660
```

```
atcgtccggc ttgcatctgc ccggatcttg cccaacatca aagctgcagg cggacaaggc      720
tccgtggatg gtgtttggca ccgggatggg actttgcttt cggtcttacg ggagaagatt      780
tcgtgaaaaa gccgcg                                                       796
```

(2) INFORMATION FOR SEQ ID NO:42

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 766 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...766

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:42

```
ccgttcaaca cataagtccg tttgtcggat gcggggggctt gccaagtgag gtcactgtct      60
gcccggatac agaccattgg agattctgta cgggagcgat tcattgccac cttctccggt      120
cactacaacg gacgcagcat cgccgggcct tgtcgttgga cagtgaaatg ataagtctta      180
ccggcctcta ccacatatcg ttacctttgg agacaccctc tcctactata tatattatgc      240
caggatgggg ttaatgatta catagtcata agtgccggca ggaatatcgg ctgagctgtt      300
ccatcaagca cgaaattcgt gggagaaaaa gatgcatcgg catgaccgga actttatact      360
cgaaaggatc gtaaagaccg gccgggatcg ttcgttggca aaccaaaaag attcttcggg      420
aatggatgcg ccgtactgat ttgatctgca tcccagagca tttgatagcc tgtgccgtct      480
tcccatacat gtgagcctcc aagataattc gtgccatacc ggcaggaatc ggatctcggg      540
atccttggcc ttggatgttc gaatacctttt ctgcaccgct tggtgcgtac agaaggagca      600
gtcttcggcc ctccctgtgc ggcagccgtc tgtccccaca caatagggat aataggacgg      660
cgagcgaaaa taaagaattc aatttttcat accttttgaa agtattaaaa gattaatggt      720
tttcgcaaga atagtctcta ccactattcg gcccgaaaag aatatg                     766
```

(2) INFORMATION FOR SEQ ID NO:43

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 2844 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...2844

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:43

```
ccctggctaa tgtctatccg atcaatagct tcgacggtat ggctaccgaa gtctcggacg      60
cttttcgtttt acgacgagca gcactttccc gatgcgtccg tggtttcgca tatcaattat      120
```

```
cactccgata cgcttaccat tcggaaggag atccgatgga gaacatccgc atccgcctgc     180
gcgagaccga tgactaaagc tctccgaagt cgtcgtcagt gtctccgctt tcggggtggg     240
aggcagcaga acaagacggt gctcaatcct atggatgtct acacgaatcc aagtgtaacg     300
gagatctctc gatggcgctg cgtcagacac ccggcctgca ggagtgggag atcgtgaggg     360
cttttcgtt cgcggaggag cctcttggga aaggccgtga cgatagaagg cattagagtg      420
aagcgttttt tcggcaagaa cgattcgacg ctcctgctcg ttcacgtttc gagacaggaa     480
tgttcagcgg ctttcgctct ccaccggagg ctatggggcc acggaaggcg gtgcgctgac     540
ggactactcc ggttgcgatt ggcgggtaag tctccctcgt ccgtcgggta ggaatatccc     600
cgcttttgt aaacggtggg ggtgggcatc tttccagtcg aatcgtttct atatagagca      660
aaatgcctca gtgagcgatg ccgccttatc cgtctgctgc tcaagccgga gtacaaactg     720
cccggtacca accgccctat gcctacaatg cacggacgat atggaacccg acttcgcaag     780
atgagtgaag gggctttttc tcttcgtaca cgacctttcc tcttcggctt tgccataccc     840
tctcctgcaa ctgcatatat gctctatgcg ggacgaaaca ccatggattc gggatggctg     900
tttggaggca tgacttcgaa ggaggcaaaa cacctccacc ctgtccgccg gctatagcga     960
agaccacaac cggctgcacc ccagcttgaa atcgagccgg acatagagag cactttccgc    1020
accgtagagg cgatgccaat atccgccttc gcttcgattc tcggattaag gcttggaact    1080
ctcctacgga tccgattata catatgcga agccaagtct tctgttcgga ggataaatca     1140
tcagccttac ccacactgcg agaacacctt gtggcaccta tgccgaagcc ctcttccctc    1200
tgtcgaatcg gatctccgct acagcggatt gcgcgccgaa tattccggac ttaccgagtc    1260
ggctattatc ctacccgttt gtcagccact tacaagctct ctccttcgag ccggatcacc    1320
ttgatgcagg aggctatgcc gcccccggcg actactacct ctcccatggc atgtgccgca    1380
aaagcgcgaa cactcgcagc agtacaacct gacctatgaa tgcgaccctc gcgtacacaa    1440
gtgctacgcc tccaagccta tgacaaagaa attcccgact gaccacgttg gctcccgatg    1500
gcacagcctc caacctcgga agggatatgc acgggggctg gacttcttct ggaaagcatc    1560
cggactgaca gatctttcga gcattggttc tcctattcct ataccgatgc tcgcaggagt    1620
atctctttc gcccgatcag gaacgaccgg atttcgtagc caagcaactc tttccaccgt     1680
gctgaagtat tggtgtgctc ctatcagctc actatcaacg tgtcgatgtc ctggcgttcc    1740
ggcatgacct accacgatcc caactagcct ccccggctta tttgaacgca tcgctaccgg    1800
ccaatttcag catagtgcct cgtacaatta cccattcaag tacaagaaag ccggcggtgt    1860
actgtcttca gcgtgcacaa tctgttcaat tcggatccca cctacggcta tgcttcgggg    1920
acaaacccat cggaggcgta tatccatcgg tcagaatctc accccttacc gacagttta     1980
tatggtaggt ctgttcatca acttcggaaa gaccgccgac aagaaatcat gaacaccgat    2040
ataaaaatca aatcaagaga aaactttcaa aagaatcgcc ctgctcctcg tcgcaggctt    2100
tgcagggtgt gtgcaacatc cgcacaaggg acggcttatg ccgaagtgat gaatcgaaag    2160
tagctgctct ggacagtgtg ccaccgacgg aatatgccac actggtgcgg acttttcccg    2220
gatagcagcc gtggaaggat ccgactggat ggctcttatt ataccgccta ctgccggata    2280
atcccggcct tcggcaaccc ctcgaggccg atcggctatg cgaagaagcc gaatccatgc    2340
tgagcaaagc ggatccctcg gcggagatct gtccgaaata gcctgtttgc gtagcatggc    2400
ccctcggcac gccttttggt caatccgcaa gaacgctggc agacatatgg gcagagagca    2460
gccgacagtt ggctgtcgcc cttgaagcca accctgctat ccgcgagcct acttcctgca    2520
ggcccaaagc ctgctgtaca cccctgcgag ttcggagggg gcaaggacaa ggccctccct    2580
tttgccgaga agagcgttcc tgctatgctg cggccacagt gtcgcctgcc tatgctccgc    2640
actgggagag cagcaagcac gccaactcct aatgctttgc aaggcagaaa cccaaagtga    2700
ctttgcggcc atcggtctcc tgatcgagaa cctctataac ctgcatcttc gaaaacacga    2760
accgaaatcg ttccgattgt ggcacgtgtt ttcgagaaaa tggcgcgaga ttttttcgtt    2820
gtggcgcgta aaattttgc ttcg                                             2844
```

(2) INFORMATION FOR SEQ ID NO:44

   (i) SEQUENCE CHARACTERISTICS:
       (A) LENGTH: 642 base pairs
       (B) TYPE: nucleic acid
       (C) STRANDEDNESS: double
       (D) TOPOLOGY: circular

  (ii) MOLECULE TYPE: DNA (genomic)

 (iii) HYPOTHETICAL: NO

  (iv) ANTI-SENSE: UNKNOWN

  (vi) ORIGINAL SOURCE:
       (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

  (ix) FEATURE:
       (A) NAME/KEY: misc_feature
       (B) LOCATION 1...642

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:44

```
cggctcgtgc aggacaatac atgcttgtct gtacgggcga tatggaatcc ttatggaaga      60
tgcctcatgg atagagttgg cttccataga agtagcaggc atacgagcac ccattcatcg     120
ttactggtgg cctccaaccc acagatcatc ttctcacagt tcatcgggcc aatcccgaga     180
cattgccgac tttcagatta caaatgaagg tggtgctact ttctccggga aaatcgaaat     240
agtggtataa aggctttctc ggaaactttc ttccaagcga aagaagaaca catggtctcg     300
cccaagggga aaccaaagta ttgtctccgg agctgactgc gaatcttctc tctatacaaa     360
tgccgaactc tttcccgatg gcacctatta catgtcatca gagagcaggg attttgggat     420
ccgatcgatt tgtttgggga cattactatc gtatccgtct cattacggat ctatcctctt     480
cggacatcgc ggtaaggatg tttctactat agtactttat cccaatcctg ctcacgactt     540
gtccatgtag ccattcctcc cacatatgcg ggcagcacac ttcgtttgtc gatattcaag     600
ggcgaatgca gctctccacg aagatcgaat ctgccgaatg cg                        642
```

(2) INFORMATION FOR SEQ ID NO:45

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 307 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: double
(D) TOPOLOGY: circular

(ii) MOLECULE TYPE: DNA (genomic)

(iii) HYPOTHETICAL: NO

(iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
(A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
(A) NAME/KEY: misc_feature
(B) LOCATION 1...307

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:45

```
ctttgaaggt cccctctaga ggatccccgg gctgttcgct ttcttttggt cgggccgatt      60
tgaggactga ataggaaata aatgttttat aagacaaaca ataagatgca gatgagaaca     120
tttcgtgtcg ttgcgatcgt ttcgctgtct tttcttcttg gatgacgctt acggcgcaaa     180
agaatagttg gtgggtggtg cccatgccgg acgcgagtac ttcaacaaca caagtgagga     240
tatgagaaag gatggaatac cggagtagtc ctgcgctact atttctccga tcgatatatt     300
ctttggc                                                                307
```

(2) INFORMATION FOR SEQ ID NO:46

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 654 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: double
(D) TOPOLOGY: circular

(ii) MOLECULE TYPE: DNA (genomic)

(iii) HYPOTHETICAL: NO

(iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
(A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
(A) NAME/KEY: misc_feature
(B) LOCATION 1...654

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:46

```
cggcagaaat aggaaaaaag gaacggatgc atgtcagact ccggttggag agcttaagct      60
cggagtccgg acctacatgc tggcagaacg tcttttttccg ataagctccc cactcaaatg     120
cgccacttgg gtgctatcga tattatgcag ccgctaacgg ccggctggac gatctgcgcc     180
tgaaaactcg tgtggaacgg atgccggagc tttgaccata cagggcagca tcggcctcga     240
ttctcctggc gacttgccga tgtagatgct catgcgacta ccgaaagact ggaatcaagc     300
tcatggcaga ccggcacgat tggcctgaac atgtggcgtt cgactgaaga tgaaggcccg     360
actggctgcc ggcaatctcc tctcgggaag tgggagggac gcgtgtcgca cctgactttc     420
cgaggctata cctatgagga ctgacgatcg acttacaggc cgacaagggg cagtggtcag     480
gcatcctgaa atgaacgacc ccaatggcca tatccggcta tcctctgccg gagaggggcg     540
cctttctctt cgagttcttc ccggttcgaa tggaatctga cagcgcacaa cttcgtcccg     600
atcgactttt gcccgcttcg gactgccatc ggccgatctc ttctgatttc ttcc           654
```

(2) INFORMATION FOR SEQ ID NO:47

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 654 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

   (ii) MOLECULE TYPE: DNA (genomic)

  (iii) HYPOTHETICAL: NO

   (iv) ANTI-SENSE: UNKNOWN

   (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

   (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...654

   (xi) SEQUENCE DESCRIPTION: SEQ ID NO:47

```
cgtattcaga gcgatatgct gctttctact gcccaaaagt ccaagaacac tggttcggca      60
actcctatat catgggtata atcaagaaca attatctgag tttggtgccc gtttcgagga     120
tctctataag cccctgcccg gacatgaccc gagatggggc gtggcgttcc tcacatgtat     180
gtgaagggaa gctatcttgg gcggagctga ctatgggaga cttctacgat cagttcggta     240
gcggttggta ttccgcacct atgaagagcg caacctcggt atagacaacg cggtcgcggc     300
ggacgtatag tactcactcc ttttgatgga gtgcgtgtca aggtattgca ggacagcagc     360
gtaactactt cgaccgcacg ggcaaggtat tcattccggc cgaggctacc tactgggttc     420
tgatctggag ctgaatgtag acgttggagc agtgccatgc gcgacaatga ctatcatttg     480
gctatcgggg atcgttcgtt tccaaacacg aagcagacga agatatattt gtgggtgtag     540
cgaagatcgc aagcgactca acctgccgct caatgtcccg attatgggct gcgcaccaac     600
tttcaaaaag gaggtctcgc cctctacgca gagtatgata caaatacaac gatc           654
```

(2) INFORMATION FOR SEQ ID NO:48

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 672 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

   (ii) MOLECULE TYPE: DNA (genomic)

  (iii) HYPOTHETICAL: NO

   (iv) ANTI-SENSE: UNKNOWN

   (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...672

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:48

```
cgatttctgg agggctatca tccgatccag acgggatagc tttacctctc gggcacatcg      60
tccgcgaggt ggcgagcagc ataagtaccc ggccgttcga atacttgaac atgaaggcag     120
agtcgtaacg cacctcttcc atcaggcgag agtggcttcg aagtcttcct ccgtctccga     180
atggaagcca cagaagggtc gctgctgatg gcgcagtccg gtatggcccg gcggatagct     240
gctacctgtc gagataccac cggcgcgtat agccgcgctt catgacgcgg agcacttgtc     300
gcttccgctc tgtgccggca ggtgtatatg attgcagata ttgggtatcg tgccatgacg     360
gcgatggcct cgtcatccat atccttgggg tgggagaggt gaagcgtatg cgcatgtcgg     420
gcacagcttc ggccactgct ggagcagatc ggggaagcgg atgatccgcc cgttttgttc     480
gtatcggtag agtttacatt ctgccccagc agcgttacct cgcggaaatt cttggcttta     540
gatcccgcac ttcgttgagg atgctttcta tttcgcggct tctttctcgc ctcgtgtgta     600
gggtacgatg cagtagctgc agaagttgtt gcacccagca tgatggagac gaatccgttg     660
atatgtacgc ca                                                         672
```

(2) INFORMATION FOR SEQ ID NO:49

    (i) SEQUENCE CHARACTERISTICS:
       (A) LENGTH: 4127 base pairs
       (B) TYPE: nucleic acid
       (C) STRANDEDNESS: double
       (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
       (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
       (A) NAME/KEY: misc_feature
       (B) LOCATION 1...4127

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:49

```
tttcgtagcc atgcacttag tgcggacgaa tgagagagag atcttcttgt ccgtgtaata      60
gatacccgtt ctatactgag agccgacatc gttccccttc tattgaggat tgtaggatct     120
atggtcttga agaaaagatc gagcagcgag agagcgatag ctcactcgga tcatattcga     180
ctcttaccgt ctcggcaatc ctgtggtttg ggaacagacc tcttcatacg aaggatcctc     240
gacatgccgt tggcataccc gacttcggta gccacgacac cacgcacttg tttgagaaat     300
gctcggtacc ccagaagcac ccaccggcaa agtatattgt cttgtctcgg gaatactgtc     360
attatgcttt gccgaagaag agcaactacc ggactaagag aaaaactaaa agaagccata     420
ctgataagaa taagagaaag aacttcataa caaatcggat tctcttttca tgagaatggg     480
gaagagacag ctcgaagtag tggcaggtcc tattcatgat gatagggctc atggttgaga     540
tagtcatggc acgatacacc tgttcggtga agaagaggcg gatcatctat gagagaaagt     600
cattcggctg agcgatattc tatcggttac agcctccgca ctgcagggct aaatccatat     660
gggcctccta tgacaaagac cattcgcggg tgccgatcag cattttcttc tgcaaaaagg     720
ctgaaaactc catgcggaat actctctgcc tcgctcatcg agcaatacgg tgctgtccga     780
cggcgaagac gagcgagtat ctcccgacct tcggcatcct tttgctgttc ggagaaagct     840
tgctacccag acggacatcg ggtattacct ccacttcgaa agaacataat ggctcaaccg     900
acgaatgtat tcctccgttg cctgaaccat tgtttgctgt cggtcttgcc tacaacgagc     960
agtacgatct tcatcagaaa gcagatcatc ccccgcatcg gcgttggaag cccaacccgt    1020
tgccggctgg acggcatgct cggttgttgc gttggaaaag tcggagcacc ggcggcagca    1080
tttcctgtgg caactgctgc tgaccttgct gcccgatata tccgcgccca tgcgccaagc    1140
cttcacatcg gtgtaccaac ggccgttgaa ctcacgcttt caatatcgac ccagaccgta    1200
acctgatcgc ctacttgata ggaagatcaa tacgatctcc ccacacgctg aagtgtattt    1260
tgcgagggta ttgacgagcg tttccagtat gtactcttgt ttttccatt cctttccgga    1320
agcttgccga ctcccgaatt gagtggcagt atctgaataa gctgcccttg aactgaatat    1380
ccatatttgt tttgttctaa catagttatc gttggttttc cacgcctccg ccatggtctt    1440
atcgaaaacc gatgatgtgg cgtacttcgg aagggttcgt gcagcacttt cacgagcgcg    1500
```

```
ttcggctcct tctcgaaccc tctgtccaaa aatgcttcat ccgcctgaat ctctaatatt    1560
cgttccctat aggagtggta aaggcgacaa tgtctgccgc caactgcttc ttgaggtgcc    1620
atagcgaata gaacagttat tatagaggtc atcgaaatgg cgatagcctc atccgaggat    1680
acgatacgga gcatggagaa aagattttcc accggtccgg cttcacgctg ttaggcactt    1740
cgggaccggc atcggtcacg gcttcattac cttcttgcta atcgtttttgg catcatcggc    1800
caaatagatg gcatgccttc gctcttgccc atcttgccgg atccatccaa gcccggcacc    1860
ttaaagctgt tgcacccgga gagaacgatt cgggttcggg gaagaagtcc actcatagat    1920
cgtattgaaa cggcgggcaa acttgcgtgc catctccatg tttgctcctg atcttttccg    1980
acaggaactt tcacggcacg atggatcaga tgtctgctgc catcaatgtc ggatatgtga    2040
gcaggccggc attgacatgt tcggctgctt acgggctttt tccttgaaag atgtcgttcg    2100
ctccagccgc ccaaatacgc attcatattc agatagagat aaagctcgag cacctcctta    2160
catcactctg tacatagatt gtagccttct ccggatcgat cccgcagcca aatattcagc    2220
cagtatcgta cgcacattgc ggactatatt atccgatgcg gatgtgtggt cagcgaatgc    2280
caatcagcaa taaagaaaaa gcattatatc gatgctgcat atccagaaaa ctccgaatag    2340
caccaaaata atgcccaaat gcagattgcc ggtcggcctg ataccactga ctacagtttc    2400
ctacacaaat cctgtttat ttgtttttccg atggtcgcaa agataggggaa aagaaactt    2460
ttgtccgtaa ttaaagcatt ttgcagattc tgcggattcg gctatcagtg caatactaag    2520
gtaaattttg caagaagcat tcgagcgggt tctgaattcg aattcctttc ttggtctaca    2580
cattcgggac attccgcaac acaccttcaa gtctggcaag acttgctcgg ccgacagaga    2640
accatcgtct ctcggaaatt tccataaagg tatcagaagt ccattctttc ggatgctgaa    2700
agtcttcgtt gctctatgaa atatacgtgc caaaaaagtt ttcacaacga agctgagttt    2760
agaatcattc caaataagta tccgaaagga agcgattttg aggtgaaaga gacaagaaag    2820
cgaccttttg gggcttgcaa ttgctttgta ggaggttgat ttgcgattta tatataaacc    2880
gttttcgatt ttatatagat cgtttctaat ttatatataa atcgcttttg attaatatat    2940
gattgattgc catttgtata taaatcggat agcccaaaag gcccttatca gggccataaa    3000
taaagagaca cgcgccaggt tcactataga actcggcggt gtctctttat tttgagtgct    3060
ttatggagag gatctgttcc tttttattgt ctgatacagc ctccccttta ttcaaatact    3120
gcgatgtcga atgtattgtc ggggcgacaa tgccgaccgc aaagctcgcg tgtgggaggt    3180
aatttagtac tcataattta ttatcgttta gtcgtttatt aaagtaattc tattgttcga    3240
aagactgttc ggtcgcaaca ttaagctttc tgtagaaacc tcttcggccg gcaaatatag    3300
cgaagccgaa actacaggga atcgtaatct gccattcaat tatcaagtgc aacggtctgc    3360
ccattttatc cgcgggtcta ttgtttagga atatgtgaag ggtgaaaagg tgtttaagat    3420
tcggcaaaaa agtgtagctt tgcaatctaa gtttttttgag aatgtccgca cagacttttt    3480
cttcaagcta ctgttgcctg ctttgctcct ttgcacagga gtcgtttcgc acaaaccaac    3540
gttgcttcct atgagcctgt ccgctacaat ggagaaggat cgtctatgcc ctcccacaga    3600
cacgcatcgt tgtacgggca caattaaacg tactatccac aagcccggac cgctccatct    3660
ctatgcccaa aggtattcgg acaggaggcc ggcggagaac cgagcatccg ttaccgtttg    3720
ggtaagtgat agcccaatct gtgggaatac ccgatttcga tcaaaaatat atatagagtt    3780
ccgtgccggt acggtggcag acttcgtaac cctcaacaaa agggtatcat agtcggtatc    3840
aatgccgaca ggcaagacct gccgtcacca ttccggacac tctcttccgt ttgccgacaa    3900
tacagcccgg catagaaaaa gtcctgcttt gcctcaggaa tataccgtgg caggcacgaa    3960
aggaaagcag cggaaatcgc cgcagcccaa gtattccgca tacgtgagag cctgatggtt    4020
tgctgaccgg tcaggctgag aacatgccca aggatggagc ggctatgagc tgatgacaca    4080
agagctgaaa gcacaggaaa ctgctctgct ggaatttttct atggaaa             4127
```

(2) INFORMATION FOR SEQ ID NO:50

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 612 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...612

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:50

```
cccggtggag aaaatagaga gaaagctgcc atcagctgga cggacgaaag atgaagttag    60
tcaccgaagg agaagaacag atcttcaagc tcatcaggaa aagtaatccc accaccccc    120
actatctctt ccgttcggaa tggaagcgat aggaaaagag gatatgctcc atgcaccgag   180
tgccggcata tcctctttct ttttcagcta ttgctgctga tgaaacagcg tcccccgtca   240
gtctacctgc gagagccatc gctgataacg acattgtaca ccttgggttc gcggcgaatt   300
ggttccttgg aatctctnct nggcattctc gacaaagaga tcgacagttc tttcttgacg   360
aggttgatcg tacaaccgcc aaatccgcca ccatgacgcg cgaaccggtc acgccacaat   420
cccgtgctat gccgttgagg agtcgagctc ttcgcagctc acctcataga gacgactcat   480
accatcgtgc tttcgtatat tttctgtcct acggtttcgt agtcgtcgcg ctccagtgct   540
cgcacacatc gagcactcgc tgcacttctt cgacgacata ctcggcacca tataatcctc   600
                                                                   612
ggcagagact tc
```

(2) INFORMATION FOR SEQ ID NO:51

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 733 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...733

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:51

```
cggcattatt ttttttctga actatcattt tcttactatg ctgtatgctt atcgtatggc    60
tgcattttgc tgaggccata cgctaaaaac atttcaaagt atgtatttgt ttggataagc   120
ttttccctat catatattat cgctgctgtc taacctctat cattgagtat cgtatcatcc   180
gccagcaatt cggttaaagt tcccgacggt attctggtgg tagaaacttc ttgtcaggcg   240
gatagtgggg taagcctgaa cgtacaagaa aattatcatt tgtgggacca aaaacgtggc   300
gcggcaattt tttgcttttg gttcgggaaa aaataatttc tcgaccaaaa cgaaaaaaaa   360
ctcgcgcgta aattttcaaa aatacgaacc atatctcgac actttgggtt cgtaaaatct   420
ttttggccaa aatctttcgg aaaaacaagg taagcctcat catctttctt gttgtggaaa   480
tccgtgtcgg atggagtttt acaccggttt tcctgtcggc ctcttccatc aataccgatg   540
aagcaattcg cagggtctgc aagtttgaac cggatacttt atttttgtct cattacgaaa   600
ctattttcgg acagcgatat gagccaaaag cctacaacga tcggaaaatc atcctcatta   660
                                                                   720
ccggcgggca cgttcgggca aaagtcctat gctgagcaga tggcactagc gcttgccgtc
                                                                   733
atcctatcta cct
```

(2) INFORMATION FOR SEQ ID NO:52

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 3401 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...3401

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:52

```
ttcataggta taaacgaaga cagcacgacc tcctttcgtg cccatcgtag gtacacgata    60
tgttgcgctc catgcttccg cctcataagt cctttatgta caatactcca aggattttac   120
cgattggctc ccttattact ggcaaggtac tctcagacta cgcgatatac gtacaggata   180
gatctaagcc ctggaacgat gtcgtacgga tggctnattc gncccgacgc catgaagaag   240
atacgaaggc tgaaagagac ggactccgct gtacgtcggc cacggtggac gaccgctgcg   300
cctctgccgt atatccatgt tccgacagga agcatangga tttgcagcgg agacattgca   360
gcggctggcg gaagtcgcca tcgaaaggca tgaggtgaaa tagtcggttg cgaagatagc   420
gaagggcgtc tactggctgc ctcttcctcg cccacgatca taacacggcc tacacgattg   480
cttccggcca attcgtgaag gacaggggcg caatgccgga gcttttgtcc tgtatgaggc   540
atttggaggg cttgtgagat ggaaggcatt catacatttg acttcgaagt tccatgttgg   600
aggggataga gggattcttc cgctcgttcg gaggtatcaa acaccttatt tccgactgtc   660
caaaggtcgg attggcttat atggccacta agacgtaaat ggcgagcctt tcatgatacc   720
ggtcagcaaa aacagtatga atactgaagt aatccactac atcattcgct ttctgatcgg   780
agataaagcg gaaacgatca gctcctcagt cgcatcggtt atacctcgaa gcaagcgaga   840
tgtcccgata cagcattgtc atccgtgctt caaacttctt cgttcggata tttacgtacc   900
gataaggctt ttcccttgtt accgctgaaa gatgggaggg cgtacctctc cttttttggag   960
agccgaccga agagctgttg aagagagcga cacactggtg ctgaatgccg acattgtcgc  1020
ctctacatat tctgatctcc cgctacgaag aggatgtacc ggcgtaaact tcgagataac  1080
acggacgatt tccgggaaga gagtccttgc ctttcaaagc aggattttac agcgtcctgt  1140
agtagatgaa tacggggcca ttctgcgcac caaaatcgtc agatgggctg gccggtaaaa  1200
gacccagtcc cccatttctc catgggaatc tgacgcatga cgtagacgaa ccgttcgagt  1260
acagaggatg gagagttttg cccgagcatt gatcaaagga acgcaaatct cccttcaagg  1320
cttccgtctg gcttatgcca atccggcaag tgatcgtttc ttcacttttc ccgtttttgtg  1380
gattgggata aaatattgcg cagcaaaatg ccggattgct gcggattatc ttcttcttca  1440
aagcacccgg aaaggcccca caggatgcac gaactattcg ctgagaaaac cgctctatca  1500
atcgctccga tctttggtta aaacaatgga atagtgatag ggcttcacag caactactct  1560
gccggtctaa cccagaactg atcggaaagc agcgcaagcg acttatgagc gataccgtat  1620
ggcagtcgac tgcaacaggc atcactacct tgcagctcgt gagccgagga catgcaagcc  1680
ctgatctcgg caggtatcag acacgattat accatgggta tgccgatgtt gcaggtttcc  1740
gccttggtac atcccgtccc gttccttcat tatgccttcc acaagacggc tgaccgagct  1800
gatcctgcac ccattacact gatggattgt acgctgcaca ggcaagagta tatgggcctg  1860
gacgaagcta cggccataga agttggtgca aggaaactgc tgatgcatac ttcatccacg  1920
gaggagaagc cacactcctt tggcacaacg aatatctctc cgcnacattc atccctggca  1980
tgcccgtttg tatcgagaag tactgaggcg atagaaacca tggaggaaaa acaagaggag  2040
gaatctttcg actacgaacg gccatcgacc aatgaaacgg gtactcatct tcgccgatat  2100
cttccctcgg cttttgctcc gagagctgcc tatctgacca aatatctgcc tcgattggtt  2160
gggaaccttt tgtaataacg gaaaaaatgc cgactccggc atcccgtcgc acggcgatgt  2220
gtttggtgga ttttgcagtg atattccggt aacgctatcg atctctcttc ggcttcgttt  2280
ctgtctcaag cgattcgttc agccgtctgt tcggcgaatt gttttgggag cagaaagaag  2340
agcgattcta caagaagcgg cgaaagcttt tcccagtgtc aaattcgatg ctgtactttg  2400
tttacctatc gcaagtttcc ccttgctacg gcttgccgct atgcacaggc catcgattgc  2460
cctgggtggc ggattgccgc gatgtgatcg aacagtacac aactacgatt ttcttcctcg  2520
tggcaagcga ctgccaagtc tgctgatgag tggcttcgac accgctatat ttctctccga  2580
aaccattatc tccacaagct gatcgtgtag tttcggtatc accctggcac tgcaatctgc  2640
tcgcagagtt aatcctcgta cagaattgat ctacaatgga tatgatcccg agcttttttct  2700
cgaggatcgc ttccttgtgg caaattcatc ctctcctata caggcgattg ctgactccgg  2760
aaatgcacga tcctaccctt ttgttcgaag cttggcttct gaagctcttc aggaggtgcg  2820
caaagagaga cgaatagagc tgactggtat gtggacgaat actcccgctc catcctgcaa  2880
ccattcattc gcagtatgct ctgaaggata tgtgccgctt tttcccgatg gttccggctg  2940
tcaggtaccc gaaattctcc gccatagcag tgtcctgctc caactgggca cacagagaag  3000
cccggaggcc cccatggtat agtatcgacc aagctattga gtcactggcc atggaaaaac  3060
ccatcctgat ggtaaggagc gatgaagtat cgtggcagat attatatcgg aggccgaggc  3120
aggattggct gcacagcgac agaagaggta gccacattcc tgagtgatca atacactcgc  3180
tggaagcaga aggggatact tctcttcgga acccgaacag gaatttttatc tccattttttc  3240
gcgtgaagag gaagccaaac aatatgctcg tctactggaa tcgtcgtcgc taactaaatt  3300
cagcatcgta tcatgaagta ctgtgatttt acccgttgcc tctcccttcg gagcctaata  3360
cgacagtcat tgccggtcct tcagtgcaga aagtgaggag c                      3401
```

(2) INFORMATION FOR SEQ ID NO:53

```
        (i) SEQUENCE CHARACTERISTICS:
            (A) LENGTH: 627 base pairs
            (B) TYPE: nucleic acid
            (C) STRANDEDNESS: double
            (D) TOPOLOGY: circular

       (ii) MOLECULE TYPE: DNA (genomic)

      (iii) HYPOTHETICAL: NO

       (iv) ANTI-SENSE: UNKNOWN

       (vi) ORIGINAL SOURCE:
            (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

       (ix) FEATURE:
            (A) NAME/KEY: misc_feature
            (B) LOCATION 1...627

       (xi) SEQUENCE DESCRIPTION: SEQ ID NO:53
```

```
tggattccgg  cagatttctc  cgtccaactt  tagaagaatg  agttggatat  ttggggtaag    60
aggtgtagat  ggattgttgg  aaacataatt  tgtagggaat  taattgctcc  ttgtataacc   120
aaatcaatgg  gatcattcgc  atttccattt  tgccaatgaa  gtctgcagta  gttacatttt   180
taacaggata  ctgcttcgtc  gcttaacccg  tcagacatca  atatgatatg  cttatccaca   240
gcagtgaagt  ggccataatg  tttctcgcca  ttttaagccc  cccctgggta  tgtgtcccca   300
aataggagtc  aaagcccgga  ttttttgaca  gagaaaagca  gtgctttggt  aaaatcagat   360
aagcgatgag  gctcatggtc  ataactcaca  aggcgatncg  cacccttct   gtagccgtcc   420
ccttaggcaa  cattttttc   aaaaacgctg  tcccgatgca  atggcagact  ttaatctggc   480
aatgttttgc  ctcccattga  cgaagactgg  tcgataacca  tcaccacatc  gacaggtacg   540
ttaccgcttt  agtagtgatt  tttagcgtca  catcccaagc  attgggattt  caggatccat   600
tggattggca  accggtaccg  catactt                                          627
```

```
(2) INFORMATION FOR SEQ ID NO:54

        (i) SEQUENCE CHARACTERISTICS:
            (A) LENGTH: 611 base pairs
            (B) TYPE: nucleic acid
            (C) STRANDEDNESS: double
            (D) TOPOLOGY: circular

       (ii) MOLECULE TYPE: DNA (genomic)

      (iii) HYPOTHETICAL: NO

       (iv) ANTI-SENSE: UNKNOWN

       (vi) ORIGINAL SOURCE:
            (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

       (ix) FEATURE:
            (A) NAME/KEY: misc_feature
            (B) LOCATION 1...611

       (xi) SEQUENCE DESCRIPTION: SEQ ID NO:54
```

```
ctgctctaat  aaagaaggtg  atataatagc  tcttgttact  tcatatacag  atttatgagt    60
ggaacccttg  cgatcagaaa  agcagatgaa  ggcaaatgca  acttgttggc  ggagatatac   120
agaatgcgat  cgttcaaaat  atatgcagat  ggacgacaac  aagattgctt  gtgaagtctt   180
cgggactcct  aacggataga  tggtcggaca  agggtttgtg  tttctgacgc  atctgtcttt   240
gatttgagtg  gtatgaagat  gaaatatacg  gaggcctgat  atttgacact  ttctctatag   300
cccttgggac  aaacttcttt  atgcgaaatt  tggtgggatt  atgtcaggag  taaagagtct   360
tttataacct  ctttcatttc  tccgacagtt  gtcaaggagt  ggatgtctat  actttggccc   420
gggaagataa  ggatcgaaag  taaactccgg  tgtctgaggt  gttgcttttc  gacctggctg   480
gcaggatggt  cttcggcaaa  ccattgataa  taaaatctat  tcggacatag  atactaacga   540
ctaaagcgaa  agcggtattt  acgtagtctc  ggtgcggtct  cttccggaag  gtatcagtcc   600
taaggtgcag  g                                                            611
```

(2) INFORMATION FOR SEQ ID NO:55

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 648 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

   (ii) MOLECULE TYPE: DNA (genomic)

  (iii) HYPOTHETICAL: NO

   (iv) ANTI-SENSE: UNKNOWN

   (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

   (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...648

   (xi) SEQUENCE DESCRIPTION: SEQ ID NO:55

```
cgatggtttg ttattcatag aagagttgcc taagatctta caatatccgt agtggtgttc    60
tttttcctca tggtaatcaa tagtataaat ctaattgagg aatcgatgga ttggctacaa   120
gtctggtgct tctggggatg ttattttat accattcttt atctatgtca atatgtattt    180
atatgtaata atctgttgtc tgttattggt tgcttgggag cttttcttcg gatgaatctt   240
tatggacaac tgagaagcga acaaagattt tcatgggaga tacgggatct ttaatttagg   300
ccttcttttg agctttatgg ccttacgctt gcttacccc attcaaatac tgctttacct    360
cttccatatg tagtagctcc gctacttatt cctggttcga tttattccat gttttttgtat  420
tgagaatttt atcaaagaaa atcctttaa acctgataag agtcatattc atcatagact     480
tatggctttg ggttgacgca gagacaaaca ctgttgtcat attactatac tctatcgcgt    540
ctctttgtta atatctttgg gtacccattt tttaatatca atgtgctgtc tgctggatat    600
cgtcatatgg atcacatcca atatgcttat agccaatttt cgcgcaaa                  648
```

(2) INFORMATION FOR SEQ ID NO:56

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 343 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

   (ii) MOLECULE TYPE: DNA (genomic)

  (iii) HYPOTHETICAL: NO

   (iv) ANTI-SENSE: UNKNOWN

   (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

   (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...343

   (xi) SEQUENCE DESCRIPTION: SEQ ID NO:56

```
tgatcgccat attgtcccaa gagcataagg atatggagga gaaagtccga agaaacttca    60
ggaaatgata gcggatacgg atcatcgtct ggatatgcgg atcggcagac cgaccgaaag   120
atcaggatcg gcagaaagaa tgccggctgc cgaagtcggg tgtcatagcc gactggctgg    180
tacgggatat gatgcgtttc agcccgtggc gaaagacacg agtggcaagc ctctgaacaa    240
tagcaggcca acagcaccga ataccggatg ctacagcgcg ccctcgccct tttcgcggag   300
agaaagagcg tctgacaccg tatttccgcc agatgaatct gac                      343
```

(2) INFORMATION FOR SEQ ID NO:57

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 656 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...656

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:57

```
ccgaaccaat ggcttggcta tatgccggag gcgatcgtag aatcaacaag tggtggggga   60
ataccggcaa tgctgagaat aagccgatca acttcttcgc ctgacaactc gcggtggact  120
tgtatatgac gtgccgatta ttacgcagaa ggtgctattc cgggagggca gtacttacct  180
tttgccaaag gcttatggcg gataagccga gttatacggt ttataggaat cgtcattaca  240
tatatgtatc aagacgctgc cggataagat agaagtgaag tattctattt gcgatggaat  300
tttagtaccc aacgatactt atatgggcta tggctacaac gtggagtcga tgagcaaggc  360
aatgtcacca ttactaatac gatgcagaat tggatcccca tgttgtgaga ctcgttgcta  420
aaaatggtgc ttactttggc tccagcctac cgatacttcg gttgagtttg ctgagttagc  480
caacggtgct cgcaaacatt caaagtaaat aaagatgctg tggcggtcgg ttctgcttac  540
tggaggttta ttacaacccg gatccgaatg caacagggtc gttccggaaa agttttatca  600
agaaatagac agacttatga aaaagtattg gtatatgctc gttgctaacg agtgtt       656
```

(2) INFORMATION FOR SEQ ID NO:58

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 1128 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...1128

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:58

```
aaggtttcaa tttcgcacaa tgagagatcg ttttttgtg caaaggtgtg tttctccttc   60
tcgagatatg tcatctttaa ttccattatt tcgtcttaga accgaacaaa ggtagaattt  120
ttaaggagaa ggataaatga aaaaacctta aaaacatgaa agtaggagat aagtgtgaga  180
atgagtgcgc ctgatcttgt gatcggcgca ctcttttcgt tgtttggtcc tatggacagt  240
ctattgtatc cggatcgtat tcgggttaga gccctcctcc tcctgatccc tgatgccacc  300
accggtttga gaattgctat cgcctgcatt ggcagaagca actccggaag cggcttgccg  360
tactcggcga acttcagatc cggagcgatc aggtacaatc ccgttcgcga gtgaccgtat  420
tgtaacgaca ctctgccctg aattgacccg aacggagttg aactgggagg ctttcacatc  480
```

```
ctctttcttc ccactcccga tcctttggcc tgtgcaatga gacggaaaca accgatgcct      540
cgagcttgat cttcttgccc gaagccaatt ccctgcgcat gacgatgcca aatcgcgcag      600
gataccgaat acatcgcccg ggctggctcc cgaaagtctg agatttgttc tgcgatgtgc      660
agggtggagg caatgctgcc gttgatactg tctgcggata ccacagcttc ttgcctgttg      720
ccttgtgggc aatacggatt gtcttctttt gaagaataac ataataattg aaagaattaa      780
tgattaataa tgcggacttt ttctgtccat taatttaata atagcaatcg agaatcgatt      840
cggcgccatc ctcttctctc tgtttgcact gcaaagataa ggtaaagaaa ctgatcgtcc      900
aaatgttttg cagaaaaaag ttttcaacaa caagggcgct ttacgcttta tatataaaac      960
ggcttccgta tttcttatac aaggcttcga agcactcttc cggctttcgt aaggggagct     1020
gaaatccggt attcggcgtt gtccgaatga tttatatata aagtatttc gattaataat      1080
aaatcgattt ttatttatat attaatcgtt ttcattttgg gggatccc                  1128
```

(2) INFORMATION FOR SEQ ID NO:59

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 1094 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...1094

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:59

```
cgggcctttg ctgttttctt cgctgagtac ggcacatgcc gatatgccgt ttggtcttcc       60
gtcatccata ttctttgggg tgtcttgcct ctggtggtgt tcctctattg gctgcttgga      120
tcattcgttt cacgagccct cggacactgc ccggcttctg cgcattcccc aaatggcttt      180
ttggctatgg gttacccgct ggctatcatc atggccaaaa cgacaggcta tgtgatggca      240
caaggtccga cagcatccgt ttggagctgc tgttggcgtt gggtggtctg cttacttgtt      300
gccttgcaat tcgggttggg cangtggcta agcaaacgat attgaaagag agcattacgg      360
ccggtcaggc tttgggacag aaaaacacgt cgttgccatt tggatgtcgc ttacctattt      420
gaatccgata gcttctatcg ccctgcaagc tatgtggtat ggcaaaattc gctcaattcc      480
atccaaatct gctatacgat aaacgaaaga ataaaaccga cagacaatga aactaacagc      540
cgatggttta cttccatcag tgaggatgag aagggcaaca tagtattctc aatggacgct      600
tggagcttga cgaattccga ctgagtggca agctgaaatc cgaatcgaaa tacgctggcc      660
ctacgaagcc gacgaacaag gtctgctaca gaatcggcag gcaaacggat cgaagagatc      720
gagctgctca tccgtaggct atggaaaagg acaagttggc catcatgaca ggcaactata      780
ccggggcgga acaaagtatt gggtctatta tgcccgtact gaacgagtat tcgcgaacgg      840
ctcaatgagg tgttggcccc ttacgaaaca ttaccgctgg agtagaatgc gaagtcgata      900
ccgactggga agagtacctc gatatgctct catgaaagac gaaaattcga tatagccatt      960
atgccatctc tctgtggcga gggagctatt ttttattggt caagcttcng aaccggatcg     1020
acgataggat gattgcgcgg atggtaggtc tcgatttcat gccggagtgt ttctctgtga     1080
tatgggtata gatc                                                       1094
```

(2) INFORMATION FOR SEQ ID NO:60

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 652 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

(iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
    (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...652

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:60

```
gctcaacaag agaagcaggt gtttcatttt ctgaaccttc cggctactga caggctttgg      60
ctgccggagg caaagctatc accatcgtag acgacaatcc ggactggctt ttgagaatcc     120
ggctctgctc ggatatgaat ccggtggcgc gcctttcttt cctatttata ttatatgagt     180
ggttcgcata tgggcatgcc tgttatgcct cgtccgtcgg agagcgtggc atgtggggtg     240
ttggctgcgt ttcctgaact acgggtctat gcaaggatac gatcagaatg cgatgccacc     300
ggctctttta gtgcttcgga tatagctgta caaggatttt acaccatgaa ctgagcaacc     360
acttccgcgg tggagtcagc ctaaaagcat tgattcttct atcgagacgt atagttcctt     420
tggccttggt gtggatgtcg gatcagttat tacgacgatg acaaaggata ttccgtttcc     480
gctctgttca gaacgtaggg gcgcaactga aaggctataa tgaagaacgg gaaccgctca     540
ttgggatttc cagctcggct tttcccgcag ttttatcaat gctccgttcg cttgcacatc     600
acgttgttca atctgaatcc gcactatttc aagcgtctgt accacgcgat ct             652
```

(2) INFORMATION FOR SEQ ID NO:61

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 1402 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...1402

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:61

```
cgacatttta tatatcgctg atagaacaag aaaactcaaa cctatgaatc agttcctgct      60
tctgaaaaca aaggtcaatc ccgtacagtg gaagacgacc gcagtacttc ggactttatc     120
tcaacctcgc acgagagaat ttgatagagt cgaaagtcat gttcgcatta agttcgggaa     180
gaagaaattg aatgaaagtc gctcaagcaa tctcttcttt gtgatcacct gctctccgtc     240
gatcgtggac caaagtctat ggccatagca gacgctatct gcctttcctc catttttcga     300
tccggatagt cagatcgaaa aagaccatga tagcaagacc ggttggatcc cgattcggcc     360
caaaggctga tcagagagct ttattcttta ctgatttcct gcgcaatgac ttctcgcaca     420
atcggcttga tggcactaca tcgagcatct cgaagtcagc'cctgacatca gctcctttat     480
taccgggaca actccttggc atgcgggaga gcacaatcgc ggtttgcaga tttcttcaac     540
ccgacgactt tgtcctggca aagaacagga aggaacaatt gataagcgag cggacggaaa     600
agaatgcctg accgttagtg gccttgcctt tttcattgcc tcttcctcga tagggagcag     660
gcttccggta tgctgagcag gattcgggat tcaaacgaac cgatgagaat tgggcacgag     720
ccgtgcacga gacctctgcg atctctgcat ccgtcatcct cacgacaggc tcgaaagcag     780
caatcgaaag aagctctctt gctcgatatg ctcaacgaac tgaaccgttg ccccgcatcc     840
tttacgatat gctccccgaa gaggagcggg cgcaagttcc tcctgcgctg gacgaaaata     900
gcatgaacaa cctctcggaa aacagcctga agaagagagt cgattgcttt gggacggctc     960
ttcggattgg gcagaggcac gaccaagagg atccgccatc aggatcgctt cccctatctg    1020
atgcttcgtt tatcgaggag atggatctgc tcaagggtat acgctttcgt gtcgatttgg    1080
tgaaatcgag ctggattctt actccaaaaa ggtaggccgg aatggtggta cgatcgcacg    1140
ataacggatc atgccttggc attcggcaag ctgtcaactt ccagaatgaa gaagaggtaa    1200
```

```
gtaggatgat cagtggagag gcgtctatcc cgtacgcttc tctctctttg ctccccgcta    1260
tgccatatac gacataagat aggctattgc catacatccg acctgtata tcctaagagt     1320
aagcagggag taagagggcc ttgagcaatc ctcagtcgat gggattatca gttgcacaac    1380
cttcgtaagc ttctcttgat gg                                            1402
```

(2) INFORMATION FOR SEQ ID NO:62

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 501 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...501

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:62

```
ttatgcctca aaaattttat attcaaaagt ttttctccca tttcaataag cttttgacat     60
tttcttctgt tgcaggctgt attttatgca ctccaaattt ttagcgatat caggagatag    120
ttttagcaat tctcttcctg tctgattatt ccaatgatta caagcttggg atatttggga    180
ttggcaacat tgtctgtgca agctttgcaa tattagacaa acgcaaactt caaatgggtc    240
aacaatctat ggaaatcatc tataacaaaa tttcctccct cttcaaaatt actataatga    300
gttgatttat tntcgtcgtt tcatctatat ttcttgctga caatattcaa aatgtatttc    360
ttcttttatg tcagataata tcttcaaaat agagaagtct ccctgttcc agtttgtccc     420
tctatgataa ctggcttctt ttacttgtta catcaattag aattttcgta gtagtttagn    480
ggttcgacat tgttaagtgc g                                             501
```

(2) INFORMATION FOR SEQ ID NO:63

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 386 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...386

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:63

```
aaaagagatc ggaagacagc gaaaagagat tgggaaacga tttatatacg aacgaattcg     60
atttatatat ttatcatttt cgatttatat ataaatcgtt tcatttaata tatagattgt    120
aaagtgtttt atatataaaa cgagaggaga aaaggcctct tcgaccgatg aaataaaaag    180
aggcacccac ccaagtcgcg accgaactcg ggcgagtgcc ttagtatctg acagaaatgt    240
cgggacttat tcgcgcttgt acatcacaaa ttcggcacaa gcgtcctcgc tcgacgatta    300
```

cttcatgtta gtcttcccag cgtacattgc gcatgtcgcc gctttggcca attcctgatg   360
gaaagcaaag cagcagtcca gatcct   386

(2) INFORMATION FOR SEQ ID NO:64

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 588 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...588

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:64

gctgtcgatg agtttcttga gtttgagctc gatttgatcg cagagggcag caattcggta   60
cgatcggcga actccacatc ttcttcgggg aagtccaatc caactccatc agccccgtaa   120
ggcgaagcaa ttcctcacgc agagcatcag ttcctcgcta tatccaccac gcagttgctt   180
catcgccatc tgatgcgtgc cttgctctcg ctggcgatga tatccgccac cggctcggca   240
ctactaggtc catacgccca ttgaggtagg cacggcgagt aaattcgccc cgnttgccag   300
accgaacagg cctgatttga tcaatgcctt cgagaatacc gtcaccgtat attatatgga   360
gccatggcag gcaatctcga ctggatgctc ggagtgaagg agtgcnggcc atggaaacac   420
gttaggataa cttcgtcaat ggttcgtccg gctccatgaa tttcgccata gaaggcggtg   480
cgaggcttgg ttccgctgaa gtcaatcggc ttggccacga tatagaaaaa gtgggctaag   540
agcggaaagc attccggacc ggacacacga attcaccgga ataccggc   588

(2) INFORMATION FOR SEQ ID NO:65

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 473 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...473

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:65

gtacaacggc tcgttcgaag ccaattatct ggtatcgaag tccggcgaca atacgtgccc   60
ggagactaca gcaagaccac cagtctgaat atccgatgac acacagtcag gatccgaagg   120
ccaatccttt gcaaacgttg tcggccatgt caattttgcc accggnagct atttccagaa   180
ttcgctgaat accaccatga tgtcaatgcc cgtactgcta cgacacgaag ttcggccgtg   240
agctatcgcg caagtttccg ggtactcctt tttcgattac gggtagcatg gatacagcca   300
gaacatgcgc gatacgacgg tgagccttac cttgccgaat cttcgattaa tatgtccacg   360

```
cgttatcctt tcaagcggaa gacccgtgta ggccggagcg atggtacgag aagttgagtg      420
tgggctattc cggtcagctt ccaatagtat cttgacaaan gagaaagatt tgc             473
```

(2) INFORMATION FOR SEQ ID NO:66

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 516 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

   (ii) MOLECULE TYPE: DNA (genomic)

  (iii) HYPOTHETICAL: NO

   (iv) ANTI-SENSE: UNKNOWN

   (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

   (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...516

   (xi) SEQUENCE DESCRIPTION: SEQ ID NO:66

```
cgggctgtaa ctacaatctt tctcattgtt ctttacttat tgtttttaag ttttgagtca      60
cggtatcacc ataatagcaa tcagtgctga gtttggcacc gtccttataa caatcggatt      120
cactttttg ttgtgagttt aatcacaatc tgtcgagaag tttatcggca tgcttcgagt       180
atgcggcgag ccatagcccg tcgacatcca atgcttcgcc atagctgacc cctcgttcga      240
tgaatgacgc tctatttcct ttatcacatc cgatcctatg tgcatttctt ccagcgggtc      300
ttcagtccga gttcgcggaa gaattcctcc gtccagcaa tagtgcatct atacgctcct       360
cctctgttcc ctcttttata tcccagattc gtcggcatat tggagcatct tctcccgctt      420
gtgatcgtgt cccaaggtgc gagagtaccc ggtagcacta tggccagcgt gtgtccgtgt      480
gtgagtccgg cagtgccgta tctcatgacc gatcat                                516
```

(2) INFORMATION FOR SEQ ID NO:67

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 889 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

   (ii) MOLECULE TYPE: DNA (genomic)

  (iii) HYPOTHETICAL: NO

   (iv) ANTI-SENSE: UNKNOWN

   (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

   (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...889

   (xi) SEQUENCE DESCRIPTION: SEQ ID NO:67

```
cggcaactcc atccttatca aggtaaacca gattggtacg ctcacagagc cctgaatgcc      60
atcgagatgg cacaccgtca cggctttacc agcgttactc gcaccgctcc ggagagacag      120
aagacaccac tatcgcagac attgctgagc aaccaactcg ggacagatca agacgggatc      180
gctcagtcgt accgacgtat ggctaagtac aaccaactgc tccgcatcga agaggagtta      240
ggccctgcgc tgtatacggc tacaagaaag tgtaagcgac aaagtacaca caggtacatc      300
tttctgccga atacggaaaa ggggaaaaga tagtaccact gccaaaaaaa gaatgccccc      360
aaagttggaa acacaacttt gggggcattt atttgccgac ttatttagaa gcgaacaccg      420
```

```
agacccacaa agaagtcatg atacgcaaag aagtcttatc cggagcatcc ttcaacatat     480
taagcaatcc tgctcatatc caatttgtac gtaataacgg tcgtagctca aggcagcagc     540
aagcccaagc ccaagtcgaa acggttatat ccgttatcac caaaggcact acagaagccg     600
taacgcctgc aactttagtc ttaatcgttc cggcgaccca tatgcgaaat agggacctgc     660
ttccaatgaa atagccatgt tgtcagaaag ctaaatctca taccggcatt caccggtatt     720
tgcagataat gcaaggagtt gtcgtttcac ttagtgattc catcttagca cctctcatcg     780
tatagccaat ccggggggcga gatagaatcc atcattgcta agagcgaact cagagcagca     840
ccaacacgta agcctacgat catcttattg ttcacgctcg tgttgcgac                 889
```

(2) INFORMATION FOR SEQ ID NO:68

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 3057 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...3057

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:68

```
ggttccatgc cntggggtat caggacttcc aaatttcatc gaataccgat tggacaatat      60
ctcgtgggct gccaagacag gtacagaccg gatagagctt tacaccgagc cgtatgcagc     120
cgcctatcat aaggacatgg ctgctgcgta cagccctatg tcaaggcttc ggtacacgct     180
cattcgctcg gtctcgtatc aatgccggac acgatttgaa tctggacaac ctccgttact     240
ttgccaacga ctgccctatt tggacgaagt ttccatcggc cacgcactga ttgcgatgct     300
ctctatttgg gactggagga gactatcaga caatatcgag accacttgcg ttataaataa     360
aatcgaaaca gtaacaatca cattgataat ccatgaatat tccaagcatt cccttctgc      420
aaattcccgt tcagtcggcg ggactcctat cgactccctt gctaccgtca atactcccgt     480
taccacaccg cagaagctac cctgtccatt atggatctgg ctctcaaagg cggttggata     540
tgatcgtatt ggctgctctt tcgctcttgg ccatctacat attcgttcca aggtgatgga     600
gatcagggct gccggcagag aagacaattc gttcatgagc ggatcaagga ttatatccac     660
gagggtaaaa tagaatcggc catgcgcttt gtcaggacag ggctacccct tctgcccgta     720
tgatagccaa ggggacaccc gactgggacg accgatgaac gacatactgg tagccgtcga     780
gaatccggaa acatcgaaat tggtaagctg gaaaaaggac tgcctattat tgcaccattg     840
cagccggagc acctatgatc ggtttcttgg gtaccgtaac ggtatggtgc gtgctttctt     900
cgatatggcc aatgccggta acggcggggt gacgtagctc tcctctcggg aggtatatac     960
gaagccttgg taacgactgt ggcggtctcg ttgtcggtat cgtaacgctt tttgcctaca    1020
actatctcga gctcaggtgg ataaggtcgt caataagatg gaaaccaaga ctcttgagtt    1080
atggatctcc ttaacgaacc catcaaaaaa tgagtctgaa acgtaaacca aggtcacaga    1140
agtttttagc atggcttcta tgaccgacgt gattttctgc tgctcatctt cttcatggtg    1200
accagtacgc tcatcgtacc caatggctac gcgtatctct tccctctgcc aataaacagc    1260
ctgcccccga agctctttgg cacggatcac catttcagaa gatatgcgct atttcgccgc    1320
tttggtcagg acaaagggca tgaggtcgct ttcgaggaga tacttcccct ctgcttcagg    1380
agcaaagtcg caatcccgaa atgtacgtag ccatatatgc cacgagaatg tcccgtatcg    1440
tgagatcgtg aaggtgttga gtatggccgg gagaacaaga tgaaggtggt gttggccacc    1500
aaagcccaaa gtaaaaagta gttcatgcaa caagagaaag tcaaacgcaa tgccgttgcc    1560
atagccgttc ggtgggggca catgtcgcac tgatcaccct cttgttcgtg ctgcatctcg    1620
tgctgctccg cgcgaagaac cggaagaact gatactgtc aatttcgaat cacggagctt     1680
tcgtccggag ctttcgagcc ggcaccacag gaaacgcatc caatcccgat gtacaaacgg    1740
aacaaactcc aacgcagaaa cagccgtagt caaaaagcag caggcaccgg ccgaatctga    1800
tctgcgtcag gactagagcc ggcacctcac ttggccaaag ccgaaaaggc ccgtcaagag    1860
gcgaaatgaa acgcaagcgt gaagccgaag aggctcgcaa acgggcagag gtgcggcaga    1920
agccgagcgc aagcgcaagg ccgaagcagg caaggctatc ataataatgt ggccggagca    1980
ttcggacgag gcgccgagca aggcaatacc aaggttcggg cacacaagcc aatggcaatc    2040
agggcaatcc cggaggtacg gttcttcgta ctcgcttacc ggccgtacta tcgtgggcaa    2100
```

```
tggcggcatc cggaaaagcc tcgctacagc aaaccgattc gaggaacggt acgagtaaca   2160
tcgtagtaaa caatgccgga cgtgtgaccg atgcttccat ccgtcgcgcg gtaccaatat   2220
cacggatgct gccgcccagc gagcagctat agaacggcca aaactactcg cttcaatgcc   2280
atagcgggtg gtggagatca ggaggagtaa tcacctatca tttcgacatc aagtaaaaaa   2340
cataaggaat ataaaaagac agcattagta tttctggctc ccggtttcga agagaccgaa   2400
gcgtaggcac gctcgatatt cttcgtcggg gaggtgtagt cgccgaattt tttccattac   2460
ggattcgctc tatgtagagg gagccaacgg gatcaccgta aagccgatcg cctgatgact   2520
gatttgccga cagtggatgc tttggtttgc cgggaggact ccccggagct gataatctga   2580
acagctgtga acctcttgcc gtcttctaag cgagcattat gccgcccaaa agcttgtggc   2640
tgctattgtg ctgctccttt ggtattcggt ggtttgggtt ttgtctgtgg cagaaagcta   2700
cttgctatcc gggctttgaa tccaaactcg aaggagccga ttatcgggtg aagctgccac   2760
acgtgacgga catgttatta caggcaaagg cccgcctgcg tctttgcatt tgccatagaa   2820
gtagttcgtt acctctgcgg tgtcaggtag ccgatgagat cgctaccggt acactcttca   2880
gataattcga aatcctatac cgcacaaaaa gaaagtgtcc cggactgcaa ggttcgggac   2940
ctttcttttt aggctcctat gcttctcgaa gcactcgctc ctttatcttt aggagagtcg   3000
ggggtaaacc gcagtgcagc ccagttgtta cgtgagcggt ttccgaaaga gtcagac      3057
```

(2) INFORMATION FOR SEQ ID NO:69

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 640 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...640

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:69

```
gactgccaag ggtccgctca gtaccgtgat acccataata tagaatcggc tcgagcagag    60
gtggtaggag gtctgcataa tcgtattgag catattggca gacccatgac atgccctaca   120
tagccgaata tggcgaagaa gagaatgtga agccgagggc ttcgaagaga tgacgcctga   180
acgtcagttt cttgtgtgag atcttgtctc catttataat gatgtatgcg gtggtttttg   240
gtgggaaaag acaaggccgg agcggagctt cgttcggtgc tccgctccgg tcttgccgtg   300
aggattatga gttggtgtag acgaccctgc ctcctttgac ggttgctcca cgaggttcat   360
accgaagtga taggagagga atttgtacga tggtattgga gtacgacgag gtcgcccttc   420
ttgcccggct cgatgctgcc gtcgtatcgg ctcttcctat ggctgcagcc ccgttgatcg   480
tgagggctgt atggcttctt cgacggtcat gcccatgtag agggtggcaa gggcaaacag   540
agggggacgg aagccgagaa gcaactgccc ggattgaggt cgctccccgt gcaacggcac   600
agccggcgtc gatcatctta cgggccggag cgtagtcgca                         640
```

(2) INFORMATION FOR SEQ ID NO:70

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 838 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
    (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...838

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:70

```
acgctcgcta tgcagatcaa ccccatgctc tgcggttctt cgttcaagac aagggcgtac    60
agacactgct cgatgccgta tgtaagttcc tgcccagccg gcagatactc ccacagtgga   120
aggtacggat ccttctgact cgagtaagtg atagagcgca agacctctcc caacgagcct   180
ctctgtgctt tggcgttaag attgctaccg acccttacgt agggcgtctt tgcttcttcc   240
gcgtaattcg ggcgaattgc ctgccggttc atacgtttac aatgctcgtt ctgaaagaag   300
gagcgtatct ctcgtctctt ccagatgcac tctaacaagc agaccccaaa gaggtgatcg   360
gttgcggtga catcggtgcc ggtgtaggct tcaggatatt cgtacgggcg atacgctttg   420
cgatgagagt catcctatcg tctcgaatct atggacttcc ccgatccggt gatcggtatt   480
gccgtggagc gaagacgcag aaggacctcg atcgtctggg tgtaggtttg gccaagctgc   540
tgaagaagac cccacgttcc gcgttcagac gaacgaagat tccggccaac ggttatcagc   600
ggtatgggtg agcttcacct cgatattatc atagacctct gcgtcgtgag tttaaggtgg   660
aatgcaacca gggacgtcct caggttctta caaggaggct atcaacgatc ctgtggagct   720
tcgcgaagtg tacaaaagca gaccggtggt cgcggtaagt ttgccgacat tatctgtcgt   780
gtgggcctgc cgatgccgac ttcgaaaggc gaattgcagt tcgtggattg agggaagg    838
```

(2) INFORMATION FOR SEQ ID NO:71

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 1088 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...1088

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:71

```
gactctctcg ttttggacgt cgctctcgaa agaataccgc cgcggacatt tcccgggcgc    60
agagagtttc cccctgtttt cggatgcgga acgagccggg taggtacgct ctatgtcaga   120
catagtcgcc aggcggccgt agagcgagat tggagttcgt tgggccgcgt atggccgaga   180
tggtgcgaga agctcgtccc ttgctgccgg cagagacatc atcctctact gctggagagg   240
aggtagcgaa gcgagagtgt cgcttggctg ctatccgtag caggacttcg catcgtcgtc   300
tccgtggcgg atacaaagca taccgccggc atttccccga tatctgaagc tttacccgtg   360
gcgtttcatc gtcttaggcg gttatacggg ataggaaaaa cgcccatcct gaacgaactc   420
acccaaatgg gggaacaggt gtcgatctgg aaggattggc ccaccacaaa gggtctgcct   480
tcggtgcctt gggcaagagc agcagccgac caccgaacat ttcatgaatc tcttgcacgt   540
gctctctccg cttgtgatcc gaatcgtccg atatgggtgg aaagcgaggc aagactatcg   600
ggcgcgtatt tcttccggac gatttctaca aagtcatcgt caagctcctt tgatcgagct   660
gtctgtcccc cgtcccgtac gcatcgccat attgccaaag agtacggcgt gtacgatgca   720
gaggcactgg caaacctttc gagcatatcg ctcgccggat gggaggagcc gctacgacac   780
aagcataact gccctcaagg aaggacgtct ggaggaggcc gtatccttgg ctccgattac   840
tatgacaagg cctatgcaca ctcgctggct gaattcaggg aagctcctct gctcgactgg   900
cagtagaaac ggatacacct cacgaaacag catcaaacta ctggaactat ctcatataaa   960
agggttacaa tcatgaaagt gtggatactc ggggggaaact ctgcccctc cctcttattt  1020
tgctcaagaa gccgttgacg gcactcccgt cggagaagaa atctccgtaa tgactgacat  1080
gaaacggc                                                          1088
```

(2) INFORMATION FOR SEQ ID NO:72

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 958 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...958

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:72

```
gccaataatt ataaaattca aacagcctaa acattcttaa tgcgatgaca ctagtaacaa      60
gcaatacaag agctnnggaa aaaattacag cgtaatcaaa tacatctcat tctgaaaaaa     120
agagaataat acggctgacc aaaataagaa aggctcaagt ggtaatacgg agaaaaccta     180
tttgcacgaa ttaagcgtag attgatagat aaaacagcaa caacaaaaca agaccaataa     240
acccagctca gcaagagcgt tcacaaactg attgtgtgag aaaactcgca tgccgtcttc     300
tgaaaattac gctcaacaac ttgagtatac ccctgtccca acaaaattca taaatattac     360
cctcactcca tccttctatc ccattcaccc aaaagaagta cgtccagatc cttttaaatc     420
cattccttct gcagaagcat tgtatgcaca ttgcgcccag ttatccttgc ctgaaactgc     480
tcgttggtat atagaaataa acaagagcaa caccaactaa gcctatcaaa aatgaaaatt     540
aaccaagtga tgaatagtaa ttttacgagg aagcattaga ataaccaggc aacaagaagc     600
atcaaccagc ctgtacggac ataggcctga aaaacagaat taatcctact acaatcagag     660
aagcattgaa acccttctga aatgactcct aaatttattc agtctaaatc cgtttgttag     720
aacgaggatt gatgcgcgaa gtangangaa tcccgcatga ggagctccaa aaattccaga     780
ataaaaactg cccctcaat tccaaaagca tcagcagata aaaagtcttc cacggagata     840
caatccccac aagtactaaa agtgatgcaa gaagtacaaa ttggctaagg tataaaggaa.     900
gaattcgagc cgatcaactc gattagagaa ttaaccaacc aaaaacgaaa aaagagag         958
```

(2) INFORMATION FOR SEQ ID NO:73

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 885 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...885

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:73

```
ggtccgctga cattcggcta ttctaccacc tatatatatg attttgcacg gatagtaagc      60
gtgctctgat cggtacgctc tccacggact ggacgcgcgt ccttccgct ttgccactat      120
catggagtac aatatggaga cgggcaagcg gatacgctta tcactcgcga tccttccatc     180
```

```
gacgcaatcc agtataaccc gacggcaaac atctgatcgt aatgggttcg gcagatgctt    240
tcggcatata ggactgaacc tgaaatcggg agtcactccc aattcttacg acaacaattc    300
ttcctgttcg atctctccac acggaaagca acagccttga ccagaatttc aaccccagtg    360
tatcggcagg gagattcgac agaaaaaaca acactattac ttcagggctg aaaacggatc    420
gcgcaagcag ctctatcggt tggatctgaa aacccttgag atcagtcaga ttcagaccgg    480
agagggatgg agtacaatgg ttcggtgtgg cagctgataa tggtgctgtc tggtacagcg    540
ccagagtgcc aacaatgctg acagactcta tcggctcgat gggaccaagg aaaactcgta    600
tgggatctgt ccgccgagaa gttggccaat atcgattcac accggcacgc gactggaact    660
atacggctcc ggatggcaca gtcgtaaggg ttggtactac ctgcctccgc aattcgatcc    720
ttccaagaaa tatccatgct ggtctattac tatggaggaa ccagcccgat caataggaca    780
ctggaggaca ctactcgctg gcgatgtatg ctgctcaggg ctacgtagtc tatcgctcaa    840
tcccagcggt actaccggct atggacagga gtatgcagct cgcac                    885
```

(2) INFORMATION FOR SEQ ID NO:74

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 1046 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...1046

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:74

```
gcttcggttt gctcggtctg tgcagagata agagagccgg ttcctgtatg cagaataggc      60
gcaatccgat attaaccgac atttcctgcc ttttgagaga aaacttctgc cacgatcatg     120
ttacgttttc acaaaagtgg cgatgaaggt gacaaaatag catgccgaac agcattcgaa     180
tgacttttgg tctaattctg ccccatcggc acggtggcac tgtatttgta gcctcttaca     240
agcaagattt acagcccgta aaaacggatt cggacgatgc ccaaaggagt attcggcgga     300
cccttcatac tttatactat aaacccttcc gactttatac ttaaaccctc caccctttat     360
actataaacc cataccactt tatactataa accataccac tttatactat aaacccatac     420
cactttatac tataaagcct catactttat agtataaagc ctgcgagctt tatagtcgga     480
agtattaaag gatgattgtc gtgctacact tgtgcaagaa aaaggatcag aacggatagc     540
tactgcaatg tgccaagcga aattggaaga aaggtttggg cgtgtgatgc ccatttgtaa     600
cgccctgtct gctgaggatc gtaggctttc agtccggatc cagccgcaca aggaaataat     660
cgaagtcgag acgaagcccc agaccgaggc caaagctatt tccttgtaga agcgatcgaa     720
acgaaagaga ccgtctcctg attctcatac tcctttatcg tccagacatt gccggcatcg     780
acaaagctgc tgcgcgaaac ttccagaaca gctttgtcct gtattcgaca ttcgatccag     840
acgaatatca cccatctgat cgaagaaggt cttgtccgga gtatcttcat actccccggg     900
ccgagggtac ggacactcca gccgcgaacg cgttcgatcc tccggcaaag taacgtaact     960
aaagggtata tggcgagcat gccataaggg aaagccagtc cgaaacccag attgcagtgc    1020
caaagtattg ccttttcgag agaacg                                        1046
```

(2) INFORMATION FOR SEQ ID NO:75

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 1026 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

(iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
    (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...1026

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:75

```
gggcctcaac aatcgaataa aacggcattt gagaatgatc ttttctcttt tcttccgtgc      60
cggagcaaga gttgcataca aggactaaag ataattgcgc atacagagtc catcgggcag     120
attggagccg gaaatcaaga tcgttcaatg cctgcgaagc agatcgagag aattacggtg     180
ttctatacgg atggcactat caagagtttc gctcaaacaa agagtaagcc tctctttttt     240
cgtaatttgc actcgaatac tgcaactcga tttctcgatg aaatacaacc ataactgcgt     300
gtcgcgacca atacgaagct aaacgacagc tatttccttc ttaacttgta ccggagcata     360
atgaagtacg attatctctg ccggaaataa agccggacag tttgttcagg tactgactgg     420
atgtccaagg ggctttttttg ctcggcctat ctctgtttgt gatgtcgatt acgaacggca     480
ggaactattc ttctggttca aaaagtaggc aagggtacac gtgctttagc ttcattacag     540
catccgattc attggatctt ctatatccgc ttggacaggg gtttacgcta acgatctgcc     600
ggatggagag tatcgtcctc ttctcgtggg tggcggttag gcactgctcc tatgctctat     660
ttggcgcgtt gtatcagaga gaggggatcg tgccggatgt tctgctcgga gcgcgttcgg     720
cagatctgat cgttagcagg acagattctc tcgttttgcc aatctgcatt gcaccacaga     780
ggatgttcgt tgggggtgaa gggctttgtc acgagccacc cgacccttcg ggaggcgatt     840
tttctcatat atatgtgtgt ggcccaaaag caatgatgat ggtgtagcat ccctggcacg     900
tcaacgaaat atcccgtgtg aaggtctctc tgagaatacc atggcttgtg gtatcgggca     960
tgtttgtgtt gtgtggaaaa tcnaaagaag gcaatctttg cgtctgtacc ggaagaccgg    1020
cttcaa                                                               1026
```

(2) INFORMATION FOR SEQ ID NO:76

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 962 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

  (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...962

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:76

```
gggccatgag tttgtccgta aaagaggcga agtagtcatc ggcacagat agtgtcgaat      60
actgtcctct ttcggacgga tattcacatc ggggtcgact gtttcatgtg agctttgtta     120
gttacgatta tagaggcttg ttcttaggca agtttaatca tcggcgcaca aaaaacgctc     180
caacttcttc acagcaggtg ggaccaatgc cttgagagca ccttccgagg taccggtgat     240
ttcggcattt ttttcgtaagg catctcatcg tagtaccgaa ggttgaacac caacgctgtt     300
tatcaggcaa ttccagtata gccttttgga aggtaatctc ggctcatctc catcgaaata     360
aacatccccc gtgaggttgt cgagcagata gggttttcgt ccgtgatcga tatactcata     420
tcgtcttcga tctttttctt ctcaggaaat tgagtgattc gtacatggct atccgataga     480
gccaggtgga agtttggcct ccccacgaaa accgtccaat gcactccatg ccttcataag     540
gtattttgga gcaagtcgtc cgtatcgtca tgactgagca ccattcgggg atttgccagt     600
agagtttacg gttgtacagg cgtactacct tttcaaagcc atacgccgcc ttgccggatc     660
tctcagctct tccagcaact cttcttcgaa atcaatagct tatcagccat aatgatgcgg     720
taaagatagc aaaaggtgct ttatctatgt caataaagtc gaagattcag ctctgatcct     780
```

```
gtaggagaga ccgaaacatg agagagttat gctcctgtgc tttccattct atgccgactc    840
tatcctttcg gctcatgcgg caatccaaat tcaaatcctt tgagttgcgc tactcagaca    900
aggtattgca aatgcctctc ggctattacc caaatacgtg cgaaaaaagt tttcaacaac    960
ta                                                                   962
```

(2) INFORMATION FOR SEQ ID NO:77

    (i) SEQUENCE CHARACTERISTICS:
       (A) LENGTH: 599 base pairs
       (B) TYPE: nucleic acid
       (C) STRANDEDNESS: double
       (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
       (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
       (A) NAME/KEY: misc_feature
       (B) LOCATION 1...599

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:77

```
ggcgaagagc atgttcgggc gtacgctcca gtcctgagct ttgccgtccg aacgtaatcg     60
aagagatagt tgtagcaatt cagaaacgta tcggggaaga tctttcgatc cggctgatga    120
tttcgccgat ctccggtttt tccccatgag ttctcgttcg aagcagaggg cattgtacca    180
gagagcattc aattcgcgag atagccctca cgggggatga cggctttgcc attcagtttg    240
gcatcatcca acttaacggg aagcctgtgc ctaagacgta gagaagccca ttttacgaat    300
ttgtgccgtc gggtgctggg cggacagata ataagatacc actcgctgac gaaggagccg    360
aatctcttgg ctgcttccag accgttgcgg cggcatactg ctggatggcc caaatagccc    420
aaatcccaac gtccggttca tcagcccgtg tatggtgtcg tcatcttcat gcagtcgcat    480
gtagcgttcc tcgccggaat gacggtattg acgatgccgt tcgaatcgct tccggtgctc    540
tacacaccag agtacagccc ggtaagtgcc acgaacagat cgcgagctga acgtcgaac     599
```

(2) INFORMATION FOR SEQ ID NO:78

    (i) SEQUENCE CHARACTERISTICS:
       (A) LENGTH: 655 base pairs
       (B) TYPE: nucleic acid
       (C) STRANDEDNESS: double
       (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
       (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
       (A) NAME/KEY: misc_feature
       (B) LOCATION 1...655

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:78

```
cagtattgcc caatgggttg atgagcgtta cccctttcaa tgtcagcggt cgacagagaa     60
tcgcttcgac aaagattcgc gttggtggag tgcgcctttt cggccgacaa tagttactgc    120
atcggtttca gccatgtgaa tctgagtgag taggctgtcc cgaactgagt ggaatactgc    180
tgatggccac ttccggacat tcgatcctga ttactgctgc tatggctctt cgctcagtcg    240
```

```
agaattgcgc gcccgggaga atacaaggct gtattggaca aatacggtat agatcagccg    300
tgaccgtaac cgagcggact gctttgaccg aatttgcttt tccgaaggag aaggccatat    360
cctgctgaac ctgggacagg ccctaagcaa tgatcgggag cctctgttcg attcttaaac    420
gactccacag tcgtcggcag cggctgatgg ggacgttctg ctacaatccg caagcagttt    480
ttcgtcagta ttcgtacttc aggtgagtcg gcgaccgatc tctgccggct attggaagag    540
cagcctccta tgacagtgga agcccaatgg gattcgactg cagggaaaat agcagtacga    600
cggctacagc gtgagatgag cgtgatgaca tcgtgtcgat ctcgtcaact ggatc         655
```

(2) INFORMATION FOR SEQ ID NO:79

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 891 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...891

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:79

```
ggggctgatg gaatatgttt ttcccgaact cttagccctc aaaggagcaa aacgcgtgat     60
ggcatcgggc ataaggacaa tctcactcat acttataagt agtggacaac ttggctcggc    120
acagcgatag tctttggctc aggtgggagc attgctacac gacataggca aaccacgcac    180
taaaaagttt gttggcgaca gtggacattt cataatcaca actttgtcgg agccaagatg    240
ctacctctct cttcaaacga ctccgacttc cgctggatgc caaactcaaa tacgacaaaa    300
actcgtagat ctgcacatgc gtccggcagc tctggtggac gaagagttac ggattctgcc    360
gttcgccgtc tgctcttcga agccggtgat gaatagatga tctgatgatg ctatgcgaag    420
ctgacattac aagcaagaat ccgacaaggt gcgcaagtat atagacaact atgctttggt    480
acgtcataag ttaaagaaat agaggagaaa gaccacgttc gcaacttcca accaccgatt    540
ccggcgaaga gattatgcag accttcggtc taaaaccatc gcgccacgtg gcaccatcaa    600
ggaggcgatc aaagaggcca tactcgacgg ggctatccca atgactacga agctgcccga    660
gttttcatga tcgaagcagc tgcttcctcg gtcttcaccc caaaaaccaa acatcatgcc    720
acagcgtata gacctcgagt gcgccccgaa gaggctactg acgaacaaat actgcgcaaa    780
catgagcgag acagacaaaa acagatccga ccgacataca tactataata atcgacgtcg    840
cagtattgac gctcgacaac gacagtatac gtcaattggg tcgaagctat a             891
```

(2) INFORMATION FOR SEQ ID NO:80

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 2496 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature

(B) LOCATION 1...2496

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:80

```
accatatatc gctatgaaat taatccaagt tcaaattcat tcttccggag gaactgattg    60
cattagagcc gaccaagttc cgcgacgaat cgcgaatgtg gtcgtacatc gtcgtacagg   120
agaaatcgaa catcgcgttt tcaaggaatt ctggagtatt tcgacaaggg tgataccttc   180
gtcttcaaca ataccctgtt tttcctgccc gtctctatgg taataaagag aaaaccggtg   240
ctcagtcgaa gttttcctcc tgcgtgaact gaatgaacga ctgaagctgt gggagtcctc   300
gtggatccgg cccgcaaaat acgcataggc aataagctct attcggcaat gatgaagagc   360
tggtggcaga ggtgatagac aatactacct ccgagggcgt acgctgcgct tcctgtacga   420
tggctctcat gacgaattca agaactgctt ttccaattgg gacagactcc tctgccgaag   480
tacatcgatc ggacgtgaac aaagaggatc cggagaggta tcaaagcata tttgccaaat   540
ggaaggcgcc gtggtggcac ctgctgccag tcttcatttc agccgcgact gatgaaacga   600
ctggagatca aggactgcca tttctcttac ataacggaca ccacgctttg ggagcttatc   660
gcgacatcga tgtagaagat ctgacaagca caaatggat agcgaggaga tgtatatcac   720
ggaggagtcg tgcataacat caaccgttca tgggacgaag aaaagaagat ctgcgccgta   780
ggaattcgat tcttcgtgct ttggaaacag ctgtgagcac agacggtcat ctcagccgtt   840
cgaaggttgg accaatcgct tcatctttcc tccatacgag ttcatctgcc ttctgctttg   900
gttacgaact tccatatgcc gctctctacc cactgatgat gacggccgct ttcggaggac   960
atgaactgat tatgagtgca acgacctcgc tgtaaaagaa aagtatcgtt tcggtgctta  1020
tggtgatgca tgctcatcat cgattgagta tggccatagt gtatctttct ttgggcagaa  1080
cttaggcgat cgacacagtt tgttgtctgc agcattggag atgctacaac gagggtgggc  1140
agactgctca ccctttctcg gttctatgaa accgagcgtg gggattcgaa tcgccccatc  1200
ctttcctcaa tgcggtggtg gctttcgatc ggaactcaaa ccacaggaca ttctgcacat  1260
cacacaagcc atcgaaggga attgggtcgt acacaaaaaa gcaatggagg ggtctatcac  1320
gatgtccgat agatatagac attctattgc attccgtata cccgaaagta catcacctga  1380
gctggaactg ccccacccac aaatgtggca acgggatttt ggcgtatgcc gctatcggac  1440
gtagctcctt ggctgcatcc ggaggctccg ctccgaacct ctgactaatg aaagaaatga  1500
atgtaaacga cttcgagata tggctccagt cggttcgtac gaatcgctta tggcagccat  1560
caaggcagag cagattcagt ttacttcggg attgaaggac tgaatatgcg tgcgcgactg  1620
ccaacaactt caccacagaa gatctgtaca aaatagccga gatttgagag ataaaggcgt  1680
aaagagctat ttaacggtga ataccgtcat atacgtgagg acatagcact catgcgctcc  1740
gtcatcgatg cggcacaaaa ggcaaaatat ctgccattat agcttccgac gtagctgcga  1800
agatgtatgc caacagatcg gagtagaagt gcatctgtcc actcagctca atatcagcaa  1860
cgggaggccc tacgctttta ttcgcgcttt gccgatgtgg tcgtattggc agagagctga  1920
atatggatca ggtgcgtaca atccacgaga ccatcgtcag gataatatct gtgggcctaa  1980
aggccatccc gtacgtatag agatgtttgt cacggcgctc tgtgtatggc cgtttcgggc  2040
aagtgctatc taagcctgac gaacacaaca gctccgccaa cagaggagcc tgtgcgcaga  2100
tctgcagagg ggctacaccg tcaaggacaa ggatagcggt ctggaactgg acattggaac  2160
caatacatca tgtcgccgaa agatctgaag actattcatt tcatcataag atgatggatg  2220
ccggcgtacg agtattcaag atagaaggaa gggccgtggc cccgaatacc gtctatacgg  2280
tctgccgctg ctataaagaa gcgtcgaagc ctactgcaac ggcacctatg atgaagaggc  2340
cataggccgg tggacgaaca attggctacg gtattcaacc cgaggctttt gggatggcta  2400
cacctcggac aacggctcgg cgaatggaca catcgttacn gctcaggagc acgcgacaga  2460
aaatatatgt aggcaagggg atcaaatact ttcagc                            2496
```

(2) INFORMATION FOR SEQ ID NO:81

  (i) SEQUENCE CHARACTERISTICS:
      (A) LENGTH: 656 base pairs
      (B) TYPE: nucleic acid
      (C) STRANDEDNESS: double
      (D) TOPOLOGY: circular

 (ii) MOLECULE TYPE: DNA (genomic)

(iii) HYPOTHETICAL: NO

 (iv) ANTI-SENSE: UNKNOWN

 (vi) ORIGINAL SOURCE:
      (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

 (ix) FEATURE:
      (A) NAME/KEY: misc_feature
      (B) LOCATION 1...656

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:81

```
cgcaattgat cgggatggct attctgattc ttctcgttct ctatgccaag gcaatgactt        60
gctcagggct tttcgctgac agaccgctat gattcggagg agacttaccc ccacaacttc       120
gaggagaaag tgggtttcga tgagattgtc gccttctcat cggccattgc catagtccga       180
tgggcagcga tcgggtatac agatgcatgc tcttgcaagg cataacgaag tcagccgctt       240
gcttgcgaga cggaagaaat gcanattatc ctgagagaag acgacttgtt tcccatctcc       300
gtctggccga tgtgcgagaa gcactaaacc gtatccgacc tgcggtacct atctggaaga       360
gcgagagttg caggatgtgg ctactgctct gagacaatcg aggctctcat ccgtttcttc       420
catgtggggg aagaagagga ggtaaggata caccgtaccc ccacctccaa actctttttgt      480
ccgaggtcat gcctttccgg atctggagaa gcgtatcagc agcttgttcg atcggttcgg       540
aaaatgaaag acaatgcctc gcccgaactg atgaatatcc gtcgcgaatc tcttccatag       600
agaaaaatat ctcgcgcact ctccaaggca tccttcgttg gctcagtccg aaagct          656
```

(2) INFORMATION FOR SEQ ID NO:82

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 1055 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

  (iii) HYPOTHETICAL: NO

   (iv) ANTI-SENSE: UNKNOWN

   (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

   (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...1055

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:82

```
cgggggattt tcctcctctt tttgggcttc tgccagcaat gagggattta ggctatgccc        60
aatcccacac tgccgtaccc ggtcacactc gctgacgagg ttatcagggt cgttgcgtgc       120
ggatgcttac ccgacccggg atcaaggata cggcatgggt agttatctgg tggcggcatc       180
gcttttttcc ggtaagtcga tgtatcgaaa ctgatctctg ccccattgga agccacttac       240
ttcggcacag agtacgccag cgtccgattc ggctgcgagg ttactatcga tacaggccgg       300
aagcaaatat atcgatggca gcatagggcc ggatgccgtg ctgaaggcaa agaccaatgc       360
acgatcgccg gcgtattcta tgaagtaact gagatacgcc ctacttgaat ggcaagaacc       420
tctatactgc accgtccatc gatctattgc caaagtgata gcaaatgata cggatgggtg       480
gcagccgttc atctcacgtt ccgatccgtt ggcaataaag tcgtggactt ggccaacaac       540
agtaccgctt ggctctggtc ttttcgtctt catcgcgtgg agacgagtta tcggctccgt       600
ggatagcgaa ctgcttgtcg atgaagtaac ccttacgtga ctactttacc cgaataaacg       660
ttatgaaccg gcgatatttt cttttgatgc ttgcttttgg agcctctgct tcatcctgtc       720
ggctcaggag tcgaagcttc tgtccggccg tcgcttttgg agttttccag cagagtgggt       780
atgctgtggg agcatccaca ccggtacccg taccccaagc catggagcac gtcacgcgtg       840
gtatccgcga ctgaatccga tggtgcaact gagtgcttcg cgcgtttgct tgccggcagt       900
ccgtgggctg tgaacgtggg tatagccgta ggaaaaaagg catggaagct actacacgag       960
tgaaagatat gaaagtagct tcgtgtcgga ctcgccttat gcccggcaac cctgatgaag      1020
aatatccgga ctattcaccg gcgacaacaa tacgg                                1055
```

(2) INFORMATION FOR SEQ ID NO:83

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 578 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

(iii) HYPOTHETICAL: NO

(iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
    (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...578

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:83

```
tcccccatag aaatctcaaa caaccgcaaa gtctttctga ccaatcaata ggggttgtaa    60
acatcactga cgggatggaa cctccgatta ttgccggatc tctgcttcct atggatcttc   120
cgtccgggtg tatggtcatg tctcacacgg tgggacatca taggccattg ctatttggat   180
atctacccaa ccaattctat ccgctcagca cgaaacccgt tgcaggagac gatgaggttt   240
ttgtcaacaa caaggcaggc aaatagagat cgatagcaac agccccatag tccagtggtc   300
gtatacgatc ttgaggggaa aagtgttttt cgcaaaagaa tgacgaaaac gcttataccc   360
tatcctttag agcacccatg ctcggcttta tgccatcatg atcgaaacac aaaattcgat   420
tatcaataaa aaacttaatg tacacagcta tgaaacgaat aattttatta ctcagtactc   480
tctgcttctt gtatcacctt atgtacaagc gcagaatgaa ggttcagatg cttattatca   540
caaatgtttg aactaatccg ttccgacttt cgaacgga                           578
```

(2) INFORMATION FOR SEQ ID NO:84

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 868 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...868

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:84

```
gagaatccaa aagcgtaata gaaaggtata caagcaaaat taggcttcac ggagttggtc    60
ttttttctta catttgtgga ctcaacaact aaatgcccat atatgctacg acttcatata   120
acatcgacaa acagtaaggc cgattttcta tcccacatac ccactctccc atcgcgaaag   180
gagagaaaag aacgctatac ctatgacgaa caagcaggaa taaggctatc aatagccgga   240
caaaacataa ggcacgcacc cgattcgagg ctgaatcagg tgcgtgcctt tctttatcgc   300
ctgtcgaaag ggctttcttc atctacgatc tatatataaa tggatgacaa tctatataga   360
tatggaaatc gatttatata taaattgaaa acattaatat acagatcgaa aatgatttat   420
atataaatcg aaaatggttg aatacaaatc gtttttccat ttcttagaaa cccgaatccg   480
agctaaagaa ttcgttttac cacctttttgg ggttcaagag gctcttactt tcaggtgcta   540
tttagaatca ttcaaaactc atcttcgttg ttgaaaactt ttttggtggt attttttcagt   600
gtttgccata agctccggag agcagagaaa aaggcctcca cgattgattg tcttcctccc   660
cctatcctac ccccaaaaat accgcttagc tacttatcga tagtatgagt gcggctccgc   720
tcttgatgcc ggcagagccg aaaaagggaa tcgtgcttca ttatttatta cttttgcgcg   780
ataagttctc gtgcagacgc ggccgatgac cggatcgtgc acaggagaag caaaacattc   840
ttacaggacc aagcgtacag tatggaaa                                      868
```

(2) INFORMATION FOR SEQ ID NO:85

    (i) SEQUENCE CHARACTERISTICS:
         (A) LENGTH: 751 base pairs
         (B) TYPE: nucleic acid
         (C) STRANDEDNESS: double
         (D) TOPOLOGY: circular

   (ii) MOLECULE TYPE: DNA (genomic)

  (iii) HYPOTHETICAL: NO

   (iv) ANTI-SENSE: UNKNOWN

   (vi) ORIGINAL SOURCE:
         (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

   (ix) FEATURE:
         (A) NAME/KEY: misc_feature
         (B) LOCATION 1...751

   (xi) SEQUENCE DESCRIPTION: SEQ ID NO:85

```
cgatcttctt ccagtatgta ggccggagat gctatgtcgt ggtattttgc atctcttagg    60
attagttctc attcggtatc agttccaaga acagctctgg agctgtgcct catcaatgac   120
agagggggcg tcgatcatga catcccgccg gcattgttct tcgggaaggc gatgcagtcg   180
cggatgctgt ccaaacggcg aagagcgata cccagcggtc taagcccgta agccaatccg   240
ccgtgggagg tgctccgtac ttgaaggcgt tcatcaggaa gccgaactgc tccttgcttt   300
ctccggcgta aagccgagca actcgaacat tttctgctgc aggcactgtc gtgaatacga   360
atggaaccac ctccgacttc gacaccgttg ataccatatc gtaggcattg gcacgcacgg   420
cacctggatc ggtatcgagc aagggatgtc ctccggcttc ggactggtga aggggtggtg   480
catggcgtag atcgcttcgt ttcctcgtcc cattcgaaga gggggaagtc cacgacccaa   540
ggcaggagaa tttaattctt gtcgcgcaga ccgagctgag agcccactcg aggcgaagtt   600
cgcacagttg cttgcgcgtc ttcatgaggt cgtctccctg aggatcagaa tcaggtcgcc   660
cggttctgcc tccatcgtcc gncgaactct tggagcgtct cttgtgtgta gaatttgtcc   720
acgctgctct tgacgtgccg tccgattcca c                                  751
```


(2) INFORMATION FOR SEQ ID NO:86

       (i) SEQUENCE CHARACTERISTICS:
            (A) LENGTH: 2231 base pairs
            (B) TYPE: nucleic acid
            (C) STRANDEDNESS: double
            (D) TOPOLOGY: circular

      (ii) MOLECULE TYPE: DNA (genomic)

     (iii) HYPOTHETICAL: NO

      (iv) ANTI-SENSE: UNKNOWN

      (vi) ORIGINAL SOURCE:
            (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

      (ix) FEATURE:
            (A) NAME/KEY: misc_feature
            (B) LOCATION 1...2231

      (xi) SEQUENCE DESCRIPTION: SEQ ID NO:86

```
cgtggttgat ctgcaaatcc accgattcta cctttctact aagaagaatc ggatttagaa    60
aaagtgtttt tctctatcga tcatgcaaaa gggacaatgt taataagaaa tatatgcctt   120
atggcacggt tttagattct gtcctaagaa tctcgttacg gatctctctg caaaaaagtt   180
gcaagtagcg gttaatatgg ggagtataaa gattggcata ataaagattc gttgtggttg   240
cgcgatgtca taccttgcat ttaatggttt tcgacgaaag tggcgagaaa acgaaaagta   300
tactgttacc ctcaatcgtt atgattatca accgactacg ttttttggca tatgctcgat   360
ggagtagctt taccggatat caatgcttct ttgtcgatgt tgtaacacat gctgacaggg   420
tttatttggt agcagccaca gtaataagac gctgttgtat tcabctgaca ggaaaaatcc   480
tgttcattgg ctttactatc gtcttccggc ttgtccggtg catgtaggca gatagccgca   540
```

```
ctgaagatgg acgcgcttgg attctaacag attccggtat ttatcaaacg atgacttcac    600
aaactggagt ttgctcccct ctgaagtccc tgtgaccccc tgctgggtgc catggtttgg    660
ccacagggaa gtcatacact ggcattcttg ctgaaaaaga tggctctctg ttctttgcca    720
ccaatatcga tggagccatt cttggcagga gcaagctccc gaaactttcc ctgttcgcaa    780
tttcgtactc aactatataa agcaaacaat catccaatgc tccgtttagt cggggtgtaa    840
cgcgtacggg tgctcctgcc acttccgttt ggatcacgag catggaaacg attggtttgg    900
acttgacttg gctgccggag ccattcccgc acaatggaaa aaggggcttt ggtgcaaact    960
ccatcggatg gtaacttgta tattatgcca cagaacaagc cgaaggtata aagcgagtag   1020
ctgtggcatt tcgactgata agggcatcac atggaaacgt ggagccgccg atattatgtg   1080
ccggccgatc ctttctacac agccggctat ccgttgtcgt tcgtctggct tttgatgatg   1140
gggcttacaa tatatatcag ttgggaggcg ttagctttca ggaacattct tttcctcaat   1200
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tatgcttagg attacgtatg acttcggcct gcgtaagact ttttgtaata acaatagggc   1920
ctcgaaacat tctaagggaa tagacctctc ttggattggt gttaggtgaa atatcttgat   1980
agaaaagaga tagatggaag gtgatggagc aagctccagt cagcagttat agtgccgagg   2040
catatcgctt tggtcatgat ggtaatggcc gttgggcaaa gatacgaggg aaagagcgat   2100
gcgaaagaca tgcggccggt gtggatgctc tgcgcgtagc tttgcgtgca gcagccggtt   2160
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aggaagtcag g                                                        2231
```

```
ggttaccggc tctctgaaag tattgcagac ctttttaagat cagtaaggtg gtacgatcgc    60
cggttgtatg gtcaaaggaa ggtaaggtca agcgaacagc aaggttcgtc tcatacgcga   120
cggtatagtg atccacaccg gagagctggc tctctgaaac gattcaagga cgatgccaag   180
gaagtggtgg ccggaccgaa tgcggtctta atctggctca ctcgaacgac atccaagatg   240
gtgattaatc gaagctttcg acgagatcga aatcaaaaag actctctaaa gatcaaccga   300
gacgggttac cacccatgaa cgcgatcgat ttagccatac tgaaattttg gcgataggat   360
tactgaaagg cctgtttgat ggtatcatca aaaggcagtt tcacttatag ccatagtcgt   420
tgccacgtat ggttgtgcct tcttgccgtt cccatagaga cgtggatcgg accttttttc   480
ggcctttcac aggcgtggct catacttttg ctttgatcgt tgggttcttg gctattttgt   540
tatcatcccg atggtcggca ataaggtctc gaaaatcgtt ggcaagaccc tatcggcatt   600
ctcaatcact tggccggcgg aatagtcggg ataggggttag cagctattct gatgagctat   660
cttttcctga ttgccgacaa tgttttttcaa gagacgaagc ggacagtgac aatccgtccc   720
ttcgcaatac ttcgagctgt atgaccatgt aaaaaacata gtcccaactt ttagccccca   780
tcggtgttta tgaattgaaa ttcgtaaaga gcttactcag agacttcaaa tatcaagaga   840
```

```
acaataatat attggatgag gttacaggca gtgaatataa atcggcttcg taaccgacat    900
cgaaacagaa actataggac gcggactttc caagatacag ttcgtctcat atctgcgaag    960
aaggaagagc cggaatggct ctcgaattcc gcctgaatgc ctataggcac tggctctcta   1020
tgaaagagcc gactgggcac acctcaatat tccaccgata gactaccaag atattatcat   1080
tatgcagctc cgaaaaagaa aaaggggccc aagagtttgg a                       1121
```

(2) INFORMATION FOR SEQ ID NO:88

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 1335 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...1335

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:88

```
atccccgcaa gctcgaaaca cccgaagccg taacggcttt cgagggactt ccatacctga    60
gccgggcctt gaaccgcgct tctgcgtacg cgaaggcggc aggaagtccc cgttacgacg   120
agatatacgg acgaggcttt ctggcagtgt tcgattttc tttcgtcgcc ggcaagcatt   180
ataccgaggc ggatgccgat cgaacatcgc cgtggcagtc attaccgaca ggttggcgcg   240
ccggtcttcg gctcttcgag cgaggccgtc ggccggcaag ctctgatcaa tggggcaaat   300
acaccgtctg cggagtggtg cgccatgtga cccctttctg cgattcgctt acggagatgt   360
gtggatgcct gtgttcaggc tgtacgaaga aaagtgaaga acaacctatt ctccagattc   420
aatgtaatct gtctggccaa agcccgaagg acttcgatgc catcaaggaa gaagtcgggg   480
ccttgactgc aagtgcaata gtgtgcagga gaagttcaat atcagttttc ccggccagct   540
gccgatcagt tcacgacgat gcaccgcaaa tttcaccgtg acgataccaa cctctggagt   600
atcgccgtcg cttcattctc ctcctggcag tgtttcttgc atcccggcca tcaatctttc   660
gggtatgacc cttagccgta tgcgtccgt ttggccgaat tgggcgtacg acgctctttc   720
ggagccgtcc gatccatata gtccgccaag tgctggcaga gaatatgctg atcagtctga   780
taggggggct ttcggattgc ttttgagtta tctggtcatg gccctctttc cctgtggctc   840
ctcagcgtgg ggagccgggg aatgatgcag ggcgacatca acgagccatg ttcaatcccg   900
tcattttcct gatagctctc gtcttctgtg tctgatcaat ctgctcagtg cctttatccc   960
tgcctggcgc atatccaaga acccatcgta gaatccctct cccactaacc tcatcataca   1020
gatattatct gctacatcat attatcaaga tcatccgcgc cgaacgtcgt gccaaccttg   1080
gatatggctg gagatgctcg tcgtatgtgg cctgctttgg ttcgtcagga ctatgccgtg   1140
acagctctgc gtgcttggac acgcccattg aactacatat agaacacgtg taccgcatca   1200
cgctggcaac cgtacaaaaa gataagatgg aaaatggaaa gagaggtctg cggatcaggg   1260
aaaaaccatg atgcaaccct cgatctgatc gctgcatatc cggagtggaa gcgcttgtct   1320
ccaagtgggg cggca                                                   1335
```

(2) INFORMATION FOR SEQ ID NO:89

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 530 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...530

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:89

```
cctgaaagta atatccggat caaggggtgt gcagaggagc atgtcatcct gtcgcacaag      60
ccatcgaaca tatctaccag atcaccgaaa cgatcgcttt gaggcatacg gcaagggcgt     120
tgatggtgaa gtcgcgacga cgcaaatatc ttccagcgta ccatcttcga ctatcggctt     180
acgactatcg tgtcggaact ttccttacgg gcacccacaa attctatctc cagatcacca     240
tgcttacttg agcggtaccg aaattggcga aaacggatag gtgagccttc cgtccagctt     300
cttggctaca gctttcgcca ggtcgatacc gcgccctacg gctctatatc gatatctttg     360
gaaggacgat tcaagaatat atctcgcaca taccacccac gacataaggt ttccagtccc     420
aactgatctg ccactttctg cataagacgg aatatcggga tgtcgattta ctaagaatta     480
actctttgtc ggcattctaa aaaatcaagg aatggattgg ccgacaaggt               530
```


(2) INFORMATION FOR SEQ ID NO:90

        (i) SEQUENCE CHARACTERISTICS:
                (A) LENGTH: 457 base pairs
                (B) TYPE: nucleic acid
                (C) STRANDEDNESS: double
                (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
            (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
            (A) NAME/KEY: misc_feature
            (B) LOCATION 1...457

        (xi) SEQUENCE DESCRIPTION: SEQ ID NO:90

```
cagcttggag gctccgagtc cgcgctgaat ctgaatggta ctggcttgat catcagacca      60
ctccaattgc tccaatatac tttcccgtct tccatacctt gacaggaact ccgttgatga     120
gtacaccgaa gttgtaagtg tcgaatcacg cacattggta cgaccatcac cgaaacctcc     180
gcttcctttt gtcgtaaggt agagggagtg gatttaacca gttcgggaaa ttcgacattc     240
aacgagctgc ctgaatatca gccacacgga tattggaaac gggtaccggc gtcaacggtc     300
tttgggcacc acagaggcta ttacctgaat ctcatccaag ccgtggcctg gggatcgagg     360
agaatcgtac cgaggtcttc ttgagaacct ctcctataga gcgagttacg gtagcataac     420
ctacgcaacg gaaagttaag aagatttggc cggtact                             457
```


(2) INFORMATION FOR SEQ ID NO:91

        (i) SEQUENCE CHARACTERISTICS:
                (A) LENGTH: 5301 base pairs
                (B) TYPE: nucleic acid
                (C) STRANDEDNESS: double
                (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

```
(vi) ORIGINAL SOURCE:
     (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
     (A) NAME/KEY: misc_feature
     (B) LOCATION 1...5301

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:91
```

```
tgtccgggtt tcttcttagg cttcggctcc acacgtcgta gtcgaaggca gggctgaaga      60
ccccgggcgg agcttgccgc gtgcggggat gctcttgact ctgccgaggg gatgaagacg     120
agcctgtgct tctggatctg atctacaaga aattcttggg gtcgtccaat tgtttggaac     180
cgaacgagag gcggaactgc ccagctcgcc gatgcgaacc gtcttgccgt tgggcagctc     240
ctcgcgagga tattgacgag gcggtccagg atgcctttga cgtcggcgga ggtcgagccg     300
actcctcggc tattcgcttg cagaggctgt ggaaggttac agatcttgtg ccgccggctg     360
ggcataatag atggtctgtc cggctttggg gcgatcttgg cgacagactt tttgatcaca     420
tactttaggg acataacttg ctattattag tttcttgtta tttgatgacc actcataccc     480
gatacatccc caagtcctcc gaaaaaaaac gtctggacgt tcggaggaaa acgtctagag     540
ttccgaataa aacgtctaga cgtttcgagc aaaaggtcta gacgtttcgg caaaacgtct     600
agacgttttt tcgaggggat attgcagacg gccacggcac gtcccggcgt ttcccggggg     660
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tcggagacag taaaataaat actcttgtcg tgtcgtttat ggagacgaag ggggcggcgt     840
cccgctcttt gcgatcgact ctccgcatcg cccccgtggg cctagcatcc gcaggcgcag     900
ccggcctcgg cgaataaggc ggagggagta aaccatcatt cgatttattt cttacatttg     960
cacgacggaa aacgaaatag cacctattct ctatcctttc gtcctgcggt atcgagtatc    1020
ctgacagtcc attccgagat gccgtatccc cctatcaaca cttatcatat ttctaaaagc    1080
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acttatttac aaaatactcg acgagaggct atcagtgtag ccggcgtccg gaaggaaaaa    1260
caaaaaacga cggagaccgg cacaccgaaa ggcgcaagcc gggtcgtccg cgcaaaaacg    1320
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gaagctcagg ccaaacgcaa gcgtggccgc cctcgcaaag cgcggaagag atagcggaag    1440
agaccgggga agatgtgcag cagctcgtgg tctggctgct gcagaggaga caaatgcaac    1500
ggagaggag agtgccgggg gaagccggcg gcgaaaacgt ccaccgcatc ccctgccaaa    1560
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cagagagggg agaagtactt cccccttcgtg cagctgcgga gtgtgaacgg tcgcagcccg    2160
aagagatccg cgaccgcgtg cccttcgatc atctcacacc cctctccccg aagagaagtt    2220
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gacgacttgc tcaggacgag accacgctga accgtatgtg gatcctgcgc aagtacctct    2940
cgacatgaat cctgtcgaag ccatggagtt tgtgcgtaag cagctggaga tacgcatacc    3000
aatatggagt tcctcgcctc gatgaacaac tgatcagttc ctgccgccgc ctcctctccg    3060
acaagagagg aggcggcagc ggacaggctc tgagtgacga gccgccctct atccggatgc    3120
agaccggcag acgaggggag ggaagtcgaa gagccgggca tatcgtcttt cggtcttctc    3180
cgtgcgctta cggtttcgtc ctgctatacc ttattattat aagtatcaat cctcatattc    3240
gttacggcag cattcatgac atcttcacgc ctctacggtc ttgggtcggt atactgtcgt    3300
ccgccacatt cgggctcatc cccctgttca cgtccggcgtt tcgaggtaagg gtgcttcgtt    3360
cgagcttatt ctcttctatc gtttttcttc gcagccatcg ccatcggtat actgcatcgc    3420
ctctcgggcg cagcttcaaa gtcagccgtg cggatatagg ccggctggta ttgctgggct    3480
cttgtatgcc ggcacggcac ttttcctctt tcacggctat ggctatatgc cagcggtgta    3540'
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gccaccacca tccacttcct ctatccgctg ttcgtcaggc tctgatgctt cttttctttg   3600
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gctgatgggc cttacggagg gggcgatcgg gtagggctta ccggctttgt gatagtcgcc   3720
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gccgggacgg cggctgacgt tctacgtctt cgtcgcagcc gcggtttttg cctgatcaac   3840
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tctctgtcaa ctgcacccct gtctggcgga atcccatcca ggcgatttgt cccctcagaa   4560
cttgttctgc tcgggcatct ctcgcaggca ctgcacgatc ttccggcgat cagccggaag   4620
tcgcccgtat ccagcggcat atcgatagac gtgatttgcg catcgtccgg tagaaacctt   4680
tggccgtcgc tttcttgaac cacgttcgcc ttcgcgatgc ttccgctgtg catagaccac   4740
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ctgatgaccg aagttgcgac tcaggttgat gtagaagaaa ggtcatcacc cttgcacagg   4920
ctgcgcaata gctccatcga accatcgcgc tgccgtcatt gacaaagatc agttcgtagt   4980
cctccgttat cgaagccgcg ccgcactcaa ccgccgcacc agctcgggaa gttccctttc   5040
ttcattaaga tcggcacgat gatggaaagc tccttcgtat aagtcgtatt gacatcatta   5100
gaattgacgt ttagattgtt ttcggcactc tcaggtgaaa aatgagtgct taggtgacaa   5160
gggtcaggac cgttcctttg tccgcttcgg gatgaaccag cggatcgtac tgtcgcgtct   5220
gaaccatgtc atttgcttgc gggatatacg cgactgttgc gttggatccg ccttacggcc   5280
tctgcccgat cgtcgagccg t                                             5301
```

(2) INFORMATION FOR SEQ ID NO:92

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 3860 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

   (ii) MOLECULE TYPE: DNA (genomic)

  (iii) HYPOTHETICAL: NO

   (iv) ANTI-SENSE: UNKNOWN

   (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

   (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...3860

   (xi) SEQUENCE DESCRIPTION: SEQ ID NO:92

```
agaagtggag gttgatccgc caattgacac gtatgcaagc tacaccgccg gcgctatctg    60
ctggcagatg tcttcgggta attgtggctt cctatttggc tacaatacgc tgcgttacct   120
cacggaagag caagagcgca tatactcact ctgtccgaat atctcttcaa cgccaagagc   180
ctgtgggtgg ggatccctat ctgctttttct ggctctctct cttcgccctc tcgggatact   240
acaacaaccc atagccaaaa gccgaatatc cgaactgctg acgaccgtgg cgtcgtgctg   300
gtcggatccg tcgtcgtctt tctgctgctc gtggtggacg acacgtacac gacacggcgc   360
tctacctgcg gctcttcttt atgatggtgg cgctgtgttg cccttgggta tatttccccc   420
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gctgctcatc ggagcggcac gatagccgaa gagacggctt cgtggctgaa gtccgtaaag   540
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gctcaagtcc tttgccacgc ttgtcgccga agcggtgaag agagcaagcc ccatcagatc   660
atcctcgccg tggattgccc cgatgcagct tcatcagtct gctcctttac cagctctatc   720
ccttccatat gccggatgcg tgccgatgcg cagcatgctt ttcgccggag ccaaagtaaa   780
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tgtaagggga tgaaaggaga gcctatggtg gacatgacgg ccaccaacat gaggaatgcg    840
ccaagagcat caagtggttc gccgaccggc tgttctccct ttgatgttga ttctgctgat    900
tccggtctat gccgtgatcg ccgttctggt cagcgttcgt cgagaggccc cgtcttcttc    960
ggacaggagc gtatcggact cacggccgac cgttacgat ctataagttt cgcaccatgt    1020
acctcgatgc gagaaggacg gcccgagtct cagcttcgat ggcgattcgc gggtcacgcc    1080
atcgggcgca tcttgcgcaa ataccggatg gacgaattgc ctcagtttgg aatgtgcttc    1140
ggggcgatat gagcttcgtg gggccgcgcc ccgaacggct ttctacatcc ggcagctcgt    1200
ggagcgtgct ccctactact acctgtgcac aatgtccgtc cgggcatcac ctcctggggc    1260
atggtacgat acggtatgct tccactccgg atgaaatgct ggaacgcctg caatacgatt    1320
ttcgtactac gagaatatga gcctcaggct ggatatagaa gtactgttat atcttgccaa    1380
acgattttta aaggattggg gaaatgaagg ataaggaaac ggtcgctacg ggtggttctt    1440
gcacttcctc ctttggcgcg aaaggcacat aacgaaaggc ttttctcat catcttgagc    1500
ctcatcatcg gtatcctctg gcttttgccg ccgttctgct caagaatacg atacacatca    1560
tccagcactc gcattcgacc gcattcgcga aacgagctat ctctatctca ttttcccgtc    1620
gtgggtattt tgatcacgtg gctatttgtg cgctacgtgg ttcgggcgac atcggccacg    1680
gggtgacgaa gattctgttt gcgatctctc agcgcaaagc cgcatcaagc cgcacaatat    1740
gtggagctcg cttgcagcca gttcattacg atcggcttcg gcggatcggt cggagccgaa    1800
tcccctatcg tacgacgggg gctgccatcg gctccaacct cggccggctc ttccgcatgg    1860
agagaagacg ctgatgctcc tcgtggggtg tggggccgca ggtgccattt cgggatcttc    1920
aaggctccga tcacggggtt ggtattcgtc atcgaagtcc cctgctggat ctgaccatgt    1980
cgtccgtgct gccgctgctg atcagctcgt cagtgccgcc gccgtatcct atattatcac    2040
ggggcaggga gccatgttag ctttacgctc aacgatcctt tttcgatgga tcgcatcccc    2100
tatgctcgct actgggtgta ttctgcggac tggtatcttt ctacttctcc aaggtctgtt    2160
cgtcttcgag agcaaactca agaactttcc acactatcgc caacgtacct catatcggcc    2220
tttatcctct gcggtctgat cttcctttc cctcgctata cggtgagggc tacgatacga    2280
tcaacgccct gctcggcggc cagacagctc tttgatggat ggcagcctgt tcgagccgta    2340
ttccaattcc tatgggtgct gttcgttttc ctcggatttta tcatcatcac gaaggtgttc    2400
gttccgtagc caccaattcg ggcggaggct gcggcggact tttcgcgccc gtctgttcat    2460
gggggcactg agcggattca tctttgccta tgcgctgaat tctttccctt catcgaggtc    2520
tatctgccac agaaaaactt tgctctcccg gcatggccgg agtgatggcc gcggtcatgc    2580
acgcgccgct gacaggtttt tcctgatcgc cgagctgacc ggcggataca atcttttcct    2640
tccgctatgc tcgtgagtac gagttcgtac gccactatcc gcctttcat gccgccagca    2700
tctattcgct ccgtttggca cagaaaggaa agctgctgac gcatagaaag acaaggccgt    2760
gctgacgctt atgacgttgg atgcggtgat agaaaggatt tcgaaccggt gagacccgat    2820
atgactctgg gagatgtcgt accgtgttcg gtatcagcca tcgcaatgtc ttccccgtcc    2880
tggacgagaa cacctgctga tggggctggt attgctggac aatatccgca atatcatgtt    2940
cggccggagc tgtatgagag attcaaggtc agccgcttca tggtttctct ccggccaaaa    3000
tagtcaatac gatgtccatg gagaccatca tgcgaatctc gacgacacca aggcttggaa    3060
cctgcccgtc atagacgagc agggatgtat ctcggattcg tgtccaaatc caagatcttc    3120
aactcttaca gggaggattg gtggagacgt tctccggcga ttgagcttcc gtacttttcc    3180
ctcttgctcc tgcccggcgg cggatccgtg tatcgtaagc tgcgggaacg ggaagctata    3240
ccctgacgat tgaattcgct atagattcgt tcgtttatat cccgtaaaca ttccacaggt    3300
cgtccgtcgc gcaccacgca cgtgccatca cctcacagag ctgtcggcca attccttcaa    3360
gaccacggtg gggagggggt cttgataata cgcggttcct catcgatcag acgcagcagc    3420
agcgttttca ccgatcgaag tcctcgttgt actcgatccc gatgatccat tcgttccgag    3480
caccgccatg cggctgtagt tgatgatcac attgctgctg agtaagcctt ggggatgaaa    3540
atgtacttgt tctcgaacgt cattaccgtg gtgtggaaag cgtcacgcca tccacgaccc    3600
cttccacatt gttggagacg atgtagcccc cactttgaac ggtttggtca gcagcacgat    3660
cagaccgccg gccagttctg aagctgtccg ctcagaccca tcccgacagc cacacccacc    3720
gaagcagcaa ggccgcgagc gaaaccggtt ggaaacccaa tgtggagata atgtgacgat    3780
cagcagcaca aagcccccga tattggcaaa ggagcgaagg aagtacgcgc tgccggctcg    3840
aacgaacgac gacccatgat                                                3860
```

(2) INFORMATION FOR SEQ ID NO:93

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 858 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

```
        (vi) ORIGINAL SOURCE:
             (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

        (ix) FEATURE:
             (A) NAME/KEY: misc_feature
             (B) LOCATION 1...858

        (xi) SEQUENCE DESCRIPTION: SEQ ID NO:93
```

```
cctgatactc ttgctattca gtgccctcgg tgtggtcgca acccgtattc acactttttc      60
ctccgcttgt ccaatgccgt tttgtatggt caggagcggt ctttctggtc cgtatgccac     120
gctatatcag ttatcggctt tttgtcttat cggccgtatc caaagcacat tgttgctctc     180
gatctgttgt ttcctctatt ggacgacaag gggcaactca ccgatttcga tttgtgggaa     240
agcctttttt cttggctttg ctcttcttcc tgttctgttt tgtcttttgg ctgtgtgaggat     300
gttttatgcc ttgtggtgct atttctttgc cgatcgtgag actagatgat ctggagaggg     360
ggttatgcgt tgctcgaatg gatgtggggg atctcctttt tcccgttgcg gtcatctatc     420
tttatatgcc acaattatat tgctaagcta cttgttacca gctattttcg tgctgtggag     480
attagtgctt tcgctaaaac gatacgattc ttctcgatca gggaagtagg ttttttccac     540
tttctttgta cctttgtgcc cacgaaattt taccgttggt ttacttgatg ccttattgga     600
gtggtcggta aacaataaag agataatggc tctatggagt aaaagtaaag aagatactca     660
tttcacagcc acaacccgta gcgggtggtc gccttattac gatattgctc agaaacatgg     720
ctgtgaggtc gtgttcgtcc tttcatccaa gtagaagtcc cgtcagtgcg agagaatttc     780
gcaacaggaa agtgaatatt ctaagaccat tcggccatca tcttcactgg acctaccagc     840
tatcgaccat ttttcagt                                                     858
```

```
    (2) INFORMATION FOR SEQ ID NO:94


        (i) SEQUENCE CHARACTERISTICS:
             (A) LENGTH: 662 base pairs
             (B) TYPE: nucleic acid
             (C) STRANDEDNESS: double
             (D) TOPOLOGY: circular        :

        (ii) MOLECULE TYPE: DNA (genomic)

       (iii) HYPOTHETICAL: NO

        (iv) ANTI-SENSE: UNKNOWN

        (vi) ORIGINAL SOURCE:
             (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

        (ix) FEATURE:
             (A) NAME/KEY: misc_feature
             (B) LOCATION 1...662

        (xi) SEQUENCE DESCRIPTION: SEQ ID NO:94
```

```
cgggggattt ctttgtggag tcgccgatca tcttgctggc ggctattatt ggttcctgaa      60
gatatatgag aacggcaggt attgcacctt tccgcatgca tcgagtttct gaacagacct     120
tatgcgcaga tctttccgat tctgactctt acgatgagct ggccaactat ctttcaccct     180
ttatggacgc atgggaggcg gcgcacagga tcaacttcag ggacagatcg cttcggccaa     240
agaatccgct ttcgaggatg atttctccgg cactttactg ggtaatgacg ggcgtgactt     300
ctcgctcgac atcaataacc cgaaagaacc gaaaatcctg gtgtgggcaa caatcccgac     360
cgacaaaata tctattcggc ggcactcggt tttacaacag ccggatcgtg aaactgatca     420
ataaaaagaa gcagctcaaa actcggtgat tatcgatgag ttgcccacca tctacttccg     480
agggctggat acctgattgc tacggctcgt tccaataaag tggcaagtct gtctgggctt     540
caggatttca gtcagcttac ccgcgattac ggagacaagg agagcaagtg attcagaaca     600
cggtgggaaa tgttttcagc ggtcaagtcg taggtgaacg gcccagacgt tatcggaacg     660
ct                                                                      662
```

```
    (2) INFORMATION FOR SEQ ID NO:95


        (i) SEQUENCE CHARACTERISTICS:
             (A) LENGTH: 395 base pairs
             (B) TYPE: nucleic acid
```

```
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
         (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
         (A) NAME/KEY: misc_feature
         (B) LOCATION 1...395

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:95
```

```
catcggccat cacacgagtg atgagcaaag gagcggtacc gctgttgcga acttgaagct      60
atgccctacc gatccttttt cttccggaat caggccaagt taaaggactg ctcctcgacc     120
tgtatttccg gactctcctg agctgtcgca acagaggagt caataggaaa aggaagaaga     180
gcagccctcg aaatgtctga cgatcatacg ccttgtacta cttgcagagc tatgctattt     240
attctcaacc cctttgatgc gtagcgtaaa ggtaccatcc ttaccattgc tgtaacggct     300
atggtctttta cgaactgacc cggacggccg gcaggattat atggacgtct attttgcttg     360
tctgacccgg agcgatgggc tctttgctaa acggg                                395
```

```
(2) INFORMATION FOR SEQ ID NO:96

     (i) SEQUENCE CHARACTERISTICS:
         (A) LENGTH: 2346 base pairs
         (B) TYPE: nucleic acid
         (C) STRANDEDNESS: double
         (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
         (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
         (A) NAME/KEY: misc_feature
         (B) LOCATION 1...2346

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:96
```

```
ggtaaatatt atttgataat ccggaagaag ttcggcaaga aaattattca ttcttcatcc      60
agattttcca gcagaagccg aatccagctg aatcagttgt cgtcgatgaa gagcaattcc     120
tcgataatcg tgaaatcctc ctgtgtcgag ccaccgagaa ggggcgtaca aattggtctt     180
tgtcgaagaa tcgggcgcat gcagcctttt gactgcagca cgaagctcct gcctcattgc     240
ggacgaatct ccgttcgtcc ctcttggatc caatcgtata tgaccacacg atgagttctt     300
cgtctttgtc gttgaatagc tgtacttccc ccgcagccgg atcatttgga cgaaaagatc     360
actgatggct atcggtgccg ttttggagct gtggggtgtt cgatcggtgt gcggaacagg     420
cgttcgagct gaatctgtac tcgttgggtt tcattgttgg ctaaagagat tgtgtatggg     480
gtttatttgg cgattgcaac tgattcagac tgtctcgaag tgtggcgatt cgcgcttcgc     540
atcgcttttc ttcttttgct ccagttctat gacagcttgc ggagccttgc cacaaagctt     600
tcgttgccga gcttcttcat gaccgaagcg aggaattctc ctgataggcc agttcgtcgg     660
acaacttctt gatctcctct cccacgcgat caatgcgccc atcgggatgg cgtattccag     720
tgtaccgatc aggaagaggt agagccgctt gtcttttctt ccactcggtt gatggcttca     780
aggtgcccat tttgatgatg acggcatcga aagaggcatc gtgttcgttt cctcttcgag     840
cgtcagcttt tccttgaaag gaatgttctt gccggtgcgg atttgcgaat ggcggctatg     900
atctcccgtg tacggtcgaa ggcttgcagg agtccctgtc cgtctcatgc gcatcgggca     960
ggaggcagag catgatggtc cgccatcgtg acgcggttcg agtgcatgcc atagctcttc    1020
tgtgataaag gcatgaaggg atggagcaaa cgcagcagct gatcgaagaa tccgatcgac    1080'
```

```
tgccgtaggt cttcgcatcc atcggctgac cgtatgccgg cttcacctct ccagatacca    1140
ggaggagaag tcgtcccaga acagcttgta aaccaggtca gtgcctcgct cagacggtac    1200
ttggagaaga gatcgtccaa ctccgcttca cctcatcgag acgatacccg aaccatttca    1260
cggccagagc cgagcttcgg gctgcgtgga cgtttctgcc tgctgccatc cttttacgag    1320
gcgaaggcat tccatatctt attgcagaag ttacgtccct gctccgagag cgttcgtcga    1380
agagcacatc gttgccggcc ggagcggcca tcatcagtcc ctgcgtactc cgtcggcacc    1440
gtatttctcc atcagcatga tcggatccgg gagttgccga ggctcttgga catctttcta    1500
ccctgaccat cgcgcacgaa ccggtcagat atacgttgtc gaagggtttc ttgccacggt    1560
attcatagct gccatgatca tacgggctac ccagaagaag agaatgtccg gagccgtacg    1620
aggtcgctcg tgggatagta gtagtccagc tcttcgttct ccggatcatc acatcgccga    1680
atacgcttat cggccatagc catgaggaga accactatcc agcgagtcgc tgtcctgtcg    1740
cagatcctct actgtgagcg agtcgatccc gtttgcttac gtgccagttc cacggctttt    1800
tcggccgtct ccgcactacg atacttccgt ccggcaggta gtaggcaggg atacgatgcc    1860
ccaccagagt tgtcggctga tgcaccagtc cttcacgttc tccatccagt gcggtaggtg    1920
ttcttgaatt tggccggatg cagtttgatc tcgtcgttca tacggcatcg agagccggtt    1980
tggccagact ttccatctgc aggaaccacg catcgagagc ttcggttcga tgggtacatc    2040
ggtacgctcg gagtagccac cttgtttacg tagttctcca ctcgctccat cagaccggca    2100
tcgatcaatc ctgttcgatc ttcttacgca catcgaatcg gtccataccg gcgtacggcc    2160
gccatgttcg ttgagaatgc cgttgtcgtg gaatatgtct atgcttcgag ccggtgtttc    2220
tgcccgagca tatagtcatt gacatcgtgt gcggtgttac tttcagacat cccgtaccga    2280
actccatatc cacatattcg tctcgatgat gggtactgca cgccctacgg tgggcactat    2340
cacccg                                                                2346
```

(2) INFORMATION FOR SEQ ID NO:97

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 1073 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...1073

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:97

```
cccgtgcttg tctcctcctt gctgctatcc aaatagagga tggccgaatg acgaagccga      60
acagactctt tcgcgactga agaatcgccc gcaatttggg atgaagccga tgcttatatc     120
gcggaaatcc aactgttgcg aggcgacacc gcgaagcggc cgaaatagcc gacagactct     180
tgtcgcgcaa ttcgccatga gacagcgacc tcaactcctg cgtgtggcag gcaatgctta     240
ctacctttgg gcgattcgaa caaaaccatc gactatcttt ccgactacag cgaaaggtgg     300
gggatcgtat cgcgcctgcc gatgcttatg cacttggtgt cactactata agcaaggtct     360
gatgaaagaa gcacttcggc cacttgccgc tgtaccactg acgccggttc tctcggtgca     420
gagtcggctc tctatctcgg aaggcacagc tggccgaggg gatgacgagc gaggcccтta     480
tggctttcga aaggctgcga ctcaggacgt caatcggccg gtacgggagg tcggaatgtc·    540
aatatggcta tgctcatgcg tagtacggga cagtcgagct ĵcggtcagcc gtacgcattg     600
cggagaactt cctcaatgag tttccccgat cttcccacgc gaacagatgg ctgctattct     660
cgtcgaatca tatttcaccg gcaaggttac aattcttccc ttagatcgat ccaaaagatt     720
gcacagccga cggctccatt ctggccgcca aacagtttgt gctgaaccgt atggcagaac     780
aaaagaagca gcgggctatg acagtgaagc actttctttt gtgtcgagca gtaatctatg     840
ggaaacaaag gggaatattt ccctgaagca tatttcctcc gagcaatctg cggtatagag     900
ccggtgactt tccgactgca gctgcggatt aagagcctat atctcggccg ccggtgatcg     960
tgatgcggcg aatcttcctt aggatattat cgtctgggct attctctatt caatgccgaa    1020
cgttacgatt ggctttggag gccttccaag antatgtatc ccnatccggt att          1073
```

(2) INFORMATION FOR SEQ ID NO:98

```
    (i)  SEQUENCE CHARACTERISTICS:
         (A)  LENGTH: 605 base pairs
         (B)  TYPE: nucleic acid
         (C)  STRANDEDNESS: double
         (D)  TOPOLOGY: circular

   (ii)  MOLECULE TYPE: DNA (genomic)

  (iii)  HYPOTHETICAL: NO

   (iv)  ANTI-SENSE: UNKNOWN

   (vi)  ORIGINAL SOURCE:
         (A)  ORGANISM: PORYPHYROMONAS GINGIVALIS

   (ix)  FEATURE:
         (A)  NAME/KEY: misc_feature
         (B)  LOCATION 1...605

   (xi)  SEQUENCE DESCRIPTION: SEQ ID NO:98
```

```
cccggtgatt atgatgaatt gcttgtttct tcggtggtat cggacaggag gagaggacca    60
ttggattctg ccgatagcga cgacaagatt agaaaaattg ctgacatatt ctattcaaaa   120
gtagtgcccc gatcggtaag gtcgtccaac agctcagtaa cgtcgtccta acagatcggt   180
aaggtcgtcc taacagttgg taacgtcgtc ctaacagctc agtaacgtcg ccctaacggc   240
tcagtaggtc gtcctattcc gatgtgaggg tcatcccttc tgcttatatg ggttttтgtg   300
cttgtaggaa gacatgccgg aggtcgttac cttatcattc gaaaggctcc gtaattttcg   360
agagaggata tgccggagag atctccccgt acgactcgga agcattgatc ttcaccgatg   420
ccgtgccact gacggatact tggtacgttg ggtaatgaaa tcggatgcat cacaaccaac   480
agctccgctg atgagagcgt gaactcctcg ccggagcctt tcagtttgat accggaagcc   540
ccgaagcgtt tatatccaat gctctgagac ggccggtgag gtttacagag aagcttcccg   600
acagg                                                                605
```

```
(2)  INFORMATION FOR SEQ ID NO:99

    (i)  SEQUENCE CHARACTERISTICS:
         (A)  LENGTH: 3248 base pairs
         (B)  TYPE: nucleic acid
         (C)  STRANDEDNESS: double
         (D)  TOPOLOGY: circular

   (ii)  MOLECULE TYPE: DNA (genomic)

  (iii)  HYPOTHETICAL: NO

   (iv)  ANTI-SENSE: UNKNOWN

   (vi)  ORIGINAL SOURCE:
         (A)  ORGANISM: PORYPHYROMONAS GINGIVALIS

   (ix)  FEATURE:
         (A)  NAME/KEY: misc_feature
         (B)  LOCATION 1...3248

   (xi)  SEQUENCE DESCRIPTION: SEQ ID NO:99
```

```
cgcaatcgga gtgttтttgg ctcgtaagaa caaaagcaac agcttcgcga tattgattcg    60
atggatcaac atcgaaactc catggcttca tgtcggggat agcctccatc tgaaaaaatt   120
gaaactcgcc ctatatcgaa tacagattat aattgctaaa cgacaaaaat tgcctctcct   180
tttgaccgat gcctgccctt actgtttggc tattatcgag agaccttgca aaaggctcat   240
gccacgaaga ggggaaatat gaaactactt gtgatttacg gatttgtact atcttgcgga   300
cgcttaattc ggaatcaaat actactataa taaagaatca agacaatgga ctctaaaatc   360
caggaactaa ccgacaaaat ttatcgcgaa gggtcgaaaa aggcaacgag caggccgcga   420
aaattatcgc tgaggctgag gcaaaagcgc agagacgatc aataatgcca aggctgaagc   480
tgaacgcatt tgagcgatgc aaagaagaag gcgacagaat ttcagcagaa taccgaatcg   540
agttgaagct ttatgctggt cagatgctgg agtcgctcaa gagtaccatg tggatcaaat   600·
```

```
ttccggagag atcgtttcgg ccaacgtaaa agcggcacga ccaaccccga attcatgcaa    660
cagatgatgc tcgatatggc caagaatggg cttcgggcga gagcatcatt atctctacac    720
aaaacgccac tgcactcagt cctatttcga aagcaatgcc aaggacttac tcaacaataa    780
ggtgcgatca aagaggtgaa caaccaaccg gtggcctata ctatccagcc caagatggct    840
catacaagat agaattcggt gaggaagagt tcatcaatct ctcaagagtt tcttgcgccc    900
caggctggtg gaaatgcttt tctaagtcat gccaaatatt acgccactgt agccggtctg    960
cccaacatca ctgtggaaga cggaaattgc cgtttacgtc cttgcagttt ctgcaggagc   1020
ttaggcctac ctgagtcgaa cggatagcaa gctcttcgat ctcctgcttt gggagcagag   1080
aatcagttcc ttcttcgcta tctggaggac agcgaaaagg ccaaggcgag gagtcccggc   1140
cgactcttct tctcttatga tacgctggat ggcatctagc tgcctatcgg gagaaacgtg   1200
tcatgccccg tatggattcg ttgccgagca tttccgcact tttttgtcgg aaaagctgac   1260
tgagatgttt cgcgggaaga agaaggagac gttggacaaa tgtccctgtc ggacactgaa   1320
gccaagaagg aaaagcacgc ctgccaatct ccgacgaaga tcgtctggcc attactatta   1380
tgaatatgcc atgaaatgcg gcaacgactt cctggaagaa tgtttgccct gaatctgcat   1440
atcaagaaca tcttggccgc gatcacgtgt gcaagttggg ctggaatccg atcaattata   1500
ttgtcggtac cggcgaaatg aagacaaatt gcgtacgtca cgggctcgcg acttcgactt   1560
gggcgaagac tgccctatct gtccacactc ttttctgtcg gtgaggagac ggacattcca   1620
aacgcgaacg tctgcttgat gtgattcgtt gggagtggct cgaagatcgg tattcaaccg   1680
cgtattcacc gtagagcgtt tgctctgcta ttattggagc tggcgatcat cgagcgttgg   1740
gtgaagttgg acgaaaagac gggaaggaga ctttccgccg catcgtcaag actctcaaac   1800
acgagagcgc agatctttgg acgagttcag aagaaatcaa aagaaataaa tcaagataat  ,1860
ggtacaaaag gagttgttaa ggggattgtg tccaacctcg tgaccgtgga gtcgacgggc   1920
cggtttccca aaatgaaatt tgctacatcg atgtcaatgg accaagctga tgagcgaggt   1980
gatcaaggtg atcggcaaaa atgcttatgg caggtttcg aaagtactcg cggtatgcac   2040
gtaggagatg aggcagagtt accggcagta tgcttgaggt aacgctcggc cccggtatgc   2100
tttcgaaaac tacgacggtc tgcaacacga cttggacaag atggacggga tcttcccaaa   2160
cgaggcgatt atactcccgc tctcgatgac gacaagctgt gggactcaag cctttggcca   2220
atgtgaacga caatgtgatc gcaggctcat ggctggagag gtgacggaaa atttccaacc   2280
ggacaagatc atggtacctt tcgtttcgaa ggcaattacc aggtgaaaag tctggccaaa   2340
gccggttcgt acaagtgaac catgtgatcg ctgtggtaac ggatcaggac gggaaagacc   2400
aaatgtaacc atggtgcaga aatggccggt gaaacgtgtc atcacttgct cgcgagaag   2460
ccgcgtcctt tcaaactgct cgaaacgggt atccgtatct cgacactttc aaccccatcg   2520
tagagggtgg tacgggattt atccccggcc tttcggtacg ggaaagacgg tgctccagca   2580
tgctatctcg aagcagggga agccgatatc gtgatcattg cagcctgtgg cgagcgtgca   2640
aacgagttgt ggagatcttt gcggaattcc cccacctgaa tgaccccac acgggcgtaa   2700
attgatggaa cgtaccatta ttattgctaa tacgtcgaat atgctgtggc ttcgcgtgag   2760
gcatccgtat atacggccat gacgatagcc gagactatcg ctccatgggc cttcgcgtgc   2820
tgatgatggc agactccact tccgttgggc acaggctctg cgtgagatgt ctaaccgtct   2880
ggaagagctt ccggaccgga tgctttcccg atggacttgt cagctatcgt agccaacttc   2940
acgctcgtgc aggatacgtt tacctgaaca acggttcggc cggttcggta cgttcatcgg   3000
tacggtatct cccgccggtg gtaacctcaa agagcctgga cggaaaacac caagaaagtg   3060
gctcgctgct tctatgcttt ggagcagatc gtgccgaccg caaacgttat ctggctgtaa   3120
accccatcga tagttatcga agtacatcga atatcccgaa ttcgagagct atatatcgaa   3180
ccacacagtg cagactggac tactaaggtg aatgagctgg aagatccgct tgcacagggt   3240
aaagaaat                                                           3248
```

(2) INFORMATION FOR SEQ ID NO:100

     (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 2612 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...2612

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:100

```
aggaccgcct gtcgccggat gcgaaaaacg aaggcaacac cgtttccagt cttcggcgga      60
aacggccttc atatatctcc atccgtaagc tccggccatt cccttacggg aacttcgagc     120
ggagtctcga aacaggtctc caattcctca aagaatccgg cccgggaata aaacggaata     180
tccccctcc tccgttcgca tcacgattac ccgtatccgc ccgtttacat aaggcatcca      240
caaagattgg aatcgtacat aaaactcaga tctcccgtaa tcaaaagggt ggttcggaat     300
atacttcgga aaaccccatt gccgtggaag tggcccctc gatccgttgg ttccgcgatt      360
gctccattct cctcccgcat aatgcgcgtg ttgaataatt ggagataacg tacgggcgtg     420
gaattagccg catgcaaagc acatcatggg gaatatgcct taaaatcact tcgaaagcct     480
tgaggtcgct caccccgcat ccgccataaa ggtacggtgc aggaggtccg ccttccgttt     540
atcttctgcc acgaaccggc ataggaaatt ccttccggtg aaagggaccc ggtgccttgt     600
ctttcaaccg tccggcgaat tccttccaaa agcccgagct cccgtacata tatgatgggt     660
aagcgcacag aaagtgtccg gagccgaaac ctctcgtcta tcccccaatg ctccgcaggt      720
ttcgccctcc gtagaaagtt ttcaacatac gggaaatcaa cgagcctccg aaagaaataa     780
ggagtccgga taaagcgatt cgtcttctcc ggctgcagcc aatacccggt ctgcgtacat     840
atccccgtat ccgtacggat attggagaga ctctcggcaa acaaaccgta tggggaaatt     900
tgcatatatc ctgcaatgcg gcggacacgt ctcgtcggga ggataaaaac cggcgacgat     960
catcactctg ggagcttcca aaaccgcttt acgagcatat cccatacctc ttccggcaat    1020
tcttgccgtc cctcacgaac gttatcgccc gctcttttcc ggaatatccg gaggaagtcc    1080
gtatagcggt tcgcaaaacg acatattgat gtgtacgggt cctcgccggg catcagggca    1140
tggttcaaca cctcattcaa acggcgattg gcatacatgc cgaggcggaa gtatcgaatt    1200
ccgctctcaa gctgcaatac gacttacgaa accggccata gctccctcct gtcgaatcgt    1260
ctgtccctcg tcctgtcgat ccattcggcc ggacggtcgg ccgttaccgc gaccaaagga    1320
atcccctgta aaaagcctcg gcaacggcag gagcataatt caacatggcc gtccggaagt    1380
acaaaccaat cctacggctt caccgaggc caaagccaat cgagagcgaa aaaaccggcg     1440
gaacgctcat ccgcaatcac gtatttctcg aagcgggatt ccgggagaaa gaaaacagaa    1500
gaggagcatt tcgcgaaccg gcgacataac gagtttacgt atgccttca tctcgaataa      1560
atccatcata cgcttacgcc tttcttatcc gaataatccg aatccatcat cttgcatatc    1620
atttatagtc cgccttatct ccgacggaat gtattccaag cacattaaaa gagtagccgc    1680
cttatccgag gtctcttccc attcgtcttc gaatacgaat ctccgtttat acctcctccc    1740
acataaagcc ggaatgcccc gggaacaatt ccatcgagcg gatgttcaca tacaatctcg    1800
cagcatcctt accacaggcc ccaaatatcc tccgtaaaat ttgcgttcat gcacctcgac    1860
ctccggatac acgccaaagc ttccttacgg gggaatccgc cgagagccgg gtaggatgaa    1920
gcgccttgag caagctttct aagccgtctc cggtcaaagc gtaaaatccg tacacaaatg    1980
gcaaatattc ccggccataa aggtacgggc tccgacatct ccacgctgcg acagtggttc    2040
tcaagcactt ccctgataag tccctgacca ctccttgctc tcttatctct ttttgtgtcc    2100
acggcttagc aactcgcctt cgaaagatac gggtctggtt ccggccaaag ccatcgcttt    2160
acacgtcctt tcgtataatc caacaggagt tccggactcg ctcccccat actccctttc      2220
ccggaataaa ataaaggaaa acgaaagcat ggggtaagcc ctccggagca actcccaata    2280
agaaaaaacg tcggagaatc cggatcgccc ctcttaaggg tcaaggtgcg ggataaaacc    2340
accttttcca atccccggaa tctatccggc gcatgatttc ctcaaaagcc gtacggtaag    2400
ctccttatcc atatctccgg attccgggca aggcatgcgg ataccggaga tacggcatcc    2460
ttcaaatccc gcaccgcctt atccgtcaaa tctccctcga ttcgaattcc cccggaatga    2520
agtaagcctc ttcttccgaa tcgaaagggc cgcaacaaaa cagggaacgg aaaaatccgc    2580
cgtcttacgc tctattctcc gctcagcgaa ac                                  2612
```

(2) INFORMATION FOR SEQ ID NO:101

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 544 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...544

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:101

```
ctgaatgtgt ataaaggaat atatcattga gccatttata tctttcattt ggagtagtaa      60
tgttcctatc attacatgac ggagcataaa ttcttttgt cttgtcttaa tgtatcatta      120
gctacaaagc gataccgtag acttgaaaac tatcagcgaa ctgccaatat tgtttgaacc      180
aagagtggtt attatagtta tagcctcatt tagtaaaaac cacatcattt gatgaatttg      240
caggcaattc ttgactttga caactggtta tataagactg atactatatc attattcgat      300
gtaacagatg atgtccatca tcctctctga tgaacccttt tattttctaa gtattgcaac      360
aacattctca tcatatacaa ctggcggtaa aactcattat cattctggtt cttataatca      420
tcaccctgtt gtacagttat gatgaaaaca cacttgacat ggcatcaata taaagttgat      480
gattgntttt gaatctgcat agattgccaa gtcaaaaata tccataatgt tggatttgta      540
attt                                                                  544
```

(2) INFORMATION FOR SEQ ID NO:102

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 555 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...555

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:102

```
agaaaggctg tcggacatat gcctatcggc agctctttcg ctgtagttcg aggcaagact      60
cgaacttcga cctttgggtt atgagcccaa cgaagctaca ttgctccact ccgcgatcaa      120
ttgtggcaca aaggtaatcc tttttgctaa aaaccaaacc gaaaaagcaa tatagctcca      180
atttctaata gtaaatcaac acaaagagaa aaacaaagac cgattaagaa gtacctctaa      240
ccggtaactc aaaagtttat ttctgtgttg caatgaaata caaacaattg agtcgaggag      300
taaagataca tgattgatcg gctcttgaaa cagggtaccc cccttctttc atcgctcaaa      360
ccattgaggt tgaagagtac cgtctccggc agcgtatcgc atttgaaagt ttatactgta      420
tccttggcct ctttcttctg tatttgggac tctcgcacat taattcgtac ttgtttgata      480
accgagtgta caatcgtttg gtttataagt gtgttaacag ttcaaatgta attgtcctga      540
gccaagtgta aggaa                                                      555
```

(2) INFORMATION FOR SEQ ID NO:103

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 845 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:

(A) NAME/KEY: misc_feature
(B) LOCATION 1...845

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:103

```
ccccggaaac caattggcat gaacattgaa aatcgacata aaaatcgacc ctgaatacag      60
cgttcatgga gtatttcatt ttcggatact tcttcgatgc tacgatcttg ccatcggcag     120
gtgctacaac ggcacggtcg tcattggaaa ggggctgtgt ctcttaggac aacgaaaaaa     180
gttgatcgta agcagaagag gaaaatggca atgatcatta ccaaatagga tacaatagaa     240
gccccagaaa ataaaacagg cttaagcata tccccgtgaa gagggttgcc atggtactaa     300
aagtccggtg ctctctttat gaaccttcat gtcgttctca tcaagttgaa atgaatcctg     360
tgggattgca cggaggaaga gtatgccctt ccccgtgttc actaatacaa aagtagcgtt     420
ttttctcatc ttcccgagcc gttgattatg ctccgggccg tgagaatgct gaaaattctt     480
ttaagattac gcatagcgcg acagattggg aaatggaaga ttcgagatgc aaaattcgat     540
ccccatggtt ggaggttttt gctatatttg ccggcccaca aagcaccccc aagaggatgt     600
agttcttgaa ggaagagttt atctgcttga tatagaaaat atgacaaata gtttacgact     660
aaatgacaac gaatatgcac acagcttcat acatcattcc cttttcatc aggccgattt      720
taccccatcc gtgtcgtcat accactgcac tattcggact aagcaagaat atctctatga     780
cgaaaaagaa gaataaggct tccatagtct cctcaaacat ataaggcacc cacgggatcc     840
tctag                                                                 845
```

(2) INFORMATION FOR SEQ ID NO:104

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 615 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...615

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:104

```
cggacagctt gcgatattgg aaatgcgagt catgatgaaa ggggtgatcc agaatcctat      60
agggtcgaat tgggagaagt agaacccggt cttttcctcc gatcggactt tctgtcgtca     120
tcgaccgcaa tcgtctttgg gcttcgccca taatggctat tctgcttcaa tctcatatcc     180
aggagagcag ctcgatagac cgtgctcccc gtctatacgc ctacggatag cagtcgctac     240
cgcttccgga cgaattgccg gtcgctcctg tttgggctgt tcgcagcagc tttggaggga     300
ggatagctcg acgtattgga aaaatgtggt tgtcggtcga gatataccct gcatcagcat     360
gtaccttggc atcgcgcatt ggcttgggga caaagtatcg gatcggtgag ccgttggcga     420
ttaggcaatg agggattggt ggggctttgg tctattataa ttatgcccga tcatctttgg     480
ctggggcagt tctgacggct atttacgata tggcttccgg aatccgttgg gaagataaac     540
ccgncttatt atggtaccca acgacgcaaa agccgttgga cttcttgaag caaactggac     600
tattcttctc cgcaa                                                      615
```

(2) INFORMATION FOR SEQ ID NO:105

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 614 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

(iii) HYPOTHETICAL: NO

(iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
    (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...614

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:105

```
ggatccccgg ccaaatgagc tgtcgcaggc agtacggagg agtaagtcag atattgaagt      60
ccgagatccc ggcgtcgaac aaagccatgt gatacgaacg gcatgcagtt ccagatcaga     120
ctcgccacta cccttggtaa tgaagaagtg ttggggatga gattccctac aagtttgctc     180
attttgtaat tgtcctgata tgttgttagt acttacactg tttcgtctcg caaagatagg     240
attatccgtc tatatccgat gaaggtttat agcacttttc cccttgcgaa tctgggaggg     300
aagtcctgtt tttctttatt cgacatagtg atgagccgtt ttgtcgatcc ggctttaggt     360
gagagggggtt ggatatgtat tgaaagcact gtctccccat ggaagaatgt catccgcatt     420
tcattaaaaa tacgtgccaa aaaagttttc aacaacgaag acgagtttgg aatgattcta     480
aataagcgct aaaaagaacc ggattttgag gtgaaaaaga agagaaaaca ggctccttgg     540
atctgaatct gctttttccgg agtttggatc acgatttata tataaatctt tttgattgta     600
tataaaacga tttc                                                        614
```

(2) INFORMATION FOR SEQ ID NO:106

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 3025 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...3025

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:106

```
ctttatattc ggagaaaagg gaaggaaaaa gcaacatccc gccactgagc agcggacggg      60
atgtgtattg gaatggtgta tggttagtct tcgtttttctc tgcaatagtt atgcagcagt     120
tgtcaaggct tcggatgatc gcgagcgctc cactcttata cctctttcct gtagagcctc     180
tctcccgttc tgaaagcttt ctctatgata aagcccatac cgacgatctt agcacttgcc     240
tgttcgccaa gtcgatgatt ccttgggcag cattgccata agcgaggaag tcgtgataaa     300
caaaatacga tcgtcatccg tcagaaagtc gtggctgata caacggtata gtctcggctt     360
ttggtaaagg aatgcactgt cgtagtcagc atttatccat cgtcttgggc tgttttttct     420
tgacgaagac aacgggcaga tcatgatgta acccaccatg atggcggggg ctatgccact     480
ggcttcgatc tgacgatctt attgactccg ctgtcggcaa agagacgagc aaattcttcg     540
ccacatggta catcagcttc gaatccatct ggtgattgat gaagctataa ctttcaatat     600
accgccggga tagcacttgc catcttgcaa gatcctcgtt tgagcaattc cataagacaa     660
agattgggtt ttctacttgt ccgccgttct atttgccacg gataagcata ttagaaatta     720
tggcagcaag accgcggtcg taattcccga agagaagata cctctcaggt caagagatat     780
gttggcaaga tgtccggcat caactcgaca cccaagccca gtgacagact gatgccaaaa     840
tcatcgtagc cctccggtct atatcctgag ctgcaatgat gctataccgg ctgcggctac     900
agttccgaac atcagcagcg tagctcctcc tatacgggat cgggcatcag agaaaagatg     960
aggccgatac ccgggaacaa ccaagcacaa tgagcatagc cgcaatatag tagcccactc    1020
gacgactggc acacccgtga gctggatcaa cccgttgttt tgggcgaaga tagaattggg    1080
aacgaattga acacgccggc gaggagcgaa ttgaagccat cggccaaact ccgcccgata    1140
```

```
cacgcttgat gtatttatca ccctccaccg gttcgccgaa atcatcgaat tggccgtaat    1200
atccccgtt gcttcgatgg ctgtataaga tagatcaacc ctatggcgat aaaggaagac     1260
agattcaggc taagccgtat ttgaatggaa cagggatatt cagcagtgcg atcttcgtcg    1320
tctcataccg gagagatcca ctcgaccgag gatgtaagcc aaaacataac cgcgagcaga    1380
ccgagtacga tggagctcat acgaatgtat ttgtttttgc tttattgaag aagaggacgc    1440
ttaccaagac gagagcagca atgctgagat ctgccagttg ccgaaagtcc cgtcgctcat    1500
cgccgcattg cctcctccga tgagataatc cccactttga tcagactcag accgatcagc    1560
aagaccacat tcccgaaacg agaggcgtaa tgatctgctt gagataacgg aaggtacgct    1620
gacgatcatc tctaccggag ctgccgctat cgtacaaccg aatatagtgg caggccgccg    1680
gccaggcccg cgctgataat cgggccgata aaagaaaact tgtgccctgc acacatagca    1740
gcccggcacc caaaggccct actctctaca ttggataaag gtggataccc ccgaagcgaa    1800
aagagccatg gagcgaggaa agaagtagtc tccagatcca gatcgagtgc tcctgcaatg    1860
atagtggggg cgtaatgata gccacaaaga tggcaaggag gtgttggaaa gagcaaagac    1920
agcatctttg aaagaaggct tgtcttcgat tttgtagatc gatctacctg tggggtagct    1980
tcattcggtg cgatggccat aataaagtcg tgttagtcgg ataatcctta ttcctcgttg    2040
ggagcaagaa aggcacaaaa taataatgaa aatgcacctg actacgctat tgcaggaata    2100
attttcccgg tagcacagag ctacatcatt gggggggtac cccaaaaaga caacaactta    2160
aaggccgaag agatagttga gcttgacgcc gagagtcagg ttcgagatct gccgtgaggg    2220
tcttgctgcc ggttgttgag gagatcatgg aagcatagta tagccgtccc tccaattcga    2280
aggctcccag tctgccggca tcgatccgaa tccgggacct ccgccaaccc ccattcgaag    2340
cgtccgtgca gacttgggca tagcgtcgct gctgcagttc ggtgaagtcc gagccttgct    2400
tacggttttc tctgcaatga tgaatccgaa ccgaggcccc aaattgagaa agcatagaga    2460
cctctttgcc ggattttaat gtgtgtgagc agaggtatct cacacaatcg aatgtgcgac    2520
gataggcatt gtccggcttt tcgtcaaatt ctcctcccat cctaagcgaa tgtagctcgc    2580
ttcggcttga aggcccattt caaggtgccc gtactctcct catttacccg tacaatgaga    2640
ccgctcaagg agccaacaag agcttttggt ccacagcggg attgaagagc accttttggc    2700
cgaaacgcct ccggctaccc cgacctgtac acgtagcgac tgctggacgt ttgggctgtg    2760
gccgagttta tcagacatag gaaaacaaaa aggtgatacc tattctacga atcatgttcc    2820
tctttggatg agccggtatg gaagggaaag tatggagcag tgcatagcag gagttatcga    2880
gatacgggca ccgatccacc cctccgtcgg agcgtagcgt gacgaggaag agattcagat    2940
gacaaaacca ctatcgcccc ttatctcgcg gaattggaag tccgtctgca ccccgtagaa    3000
ggaagcatgg agagttgttc ctgag                                          3025
```

(2) INFORMATION FOR SEQ ID NO:107

        (i) SEQUENCE CHARACTERISTICS:
            (A) LENGTH: 548 base pairs
            (B) TYPE: nucleic acid
            (C) STRANDEDNESS: double
            (D) TOPOLOGY: circular

       (ii) MOLECULE TYPE: DNA (genomic)

      (iii) HYPOTHETICAL: NO

       (iv) ANTI-SENSE: UNKNOWN

       (vi) ORIGINAL SOURCE:
            (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

       (ix) FEATURE:
            (A) NAME/KEY: misc_feature
            (B) LOCATION 1...548

       (xi) SEQUENCE DESCRIPTION: SEQ ID NO:107

```
ctgggcaaaa catgacgaaa cgatgagcta ccgtgccgta ccaggtgtgt gtacaccaat     60
cccgaggtcg ccggtgtggg agagacggaa gaatcgctcg caaagcagga cgtgcctaca    120
ctgttcgtcg ccttcctatg gccttctcgg tcgatttgta gcagaaacg aacaaggcaa     180
tggagagtgc aaactatact tgatgaagag aaccgcttga tcggagcaca cctcattggc    240
aatccgccgg cgaactcatc gtaaccgctg ccatggccat cgagaccggc atgaggatcg    300
acaaatcgaa cgaatcatat tccctcatcc gactgtaggc gaatcctaaa agaaactctc    360
gccgaggtt gatactcttt ctgccctttt ctaggaaatc aaatctaaaa agtccgtgca     420
gtcaacaaaa actgcacgga ctttttcctct cttaatatct ttttctcaga gtattcggag    480
taccttcgaa gacagcaccc gaaaaacgag accttggaa aataaggaga tggaggaaaa     540
gacttaaa                                                            548
```

(2) INFORMATION FOR SEQ ID NO:108

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 866 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...866

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:108

```
gtaaaaacac agtatgacga agcctgaacc acagacatca atatcttcaa ataagaaatg      60
aaaaaagaca gcgtaatttt cgatctgatc gaaaaagaca tcagcgccag ctcaaaggca     120
tcgagctgat cgcatcggaa aactttgaag cgaacaagtt atgcangcta tgggtagctg     180
tatgaccaat aagtatccga aagttatccc ggcaaacgct attacggtgg ttgtgaagtg     240
gtagacaaag cgagcaaatc gccatcgacc gtatcaaaca actctacgga gccgatgggc     300
caacgtacag cctcactccg gagcacaggc caatatggcc gttttctggc ttgcctcgaa     360
gcaggcgata cgttcatggg actgaacctc gacacggcgg ccacctatcg cacggctcac     420
tcgtcaatag ctcgggtatc cctaccgtcc catcggctac aatctgagcg aagagacggg     480
aatggtggat acgaccacat ggagaaaatg gccatcgagc acaaacccaa gctgatcatg     540
gcggtggttc ggcctattct cgtgagtggg actacaagcg tatgcgtgga tcgctgacaa     600
ggtgggtgcc ttgttgatga tcgatatggc acaccctccg gtctgatcgc tgccggtctg     660
ctggagaacc ccgtgaagta tgctcaatcg ttacttctac gactcacaag acactgcgtg     720
gcccccgtgg cggtacatcc ttatgggcaa ggacttcgac aatccttggg gcaagaaaac     780
cccgagggcg agatcaagaa gatgagcgca ctccttgact ctgccgtatt cccgtgtaca     840
ggtggtccgt tcgacacgtt atagct                                         866
```

(2) INFORMATION FOR SEQ ID NO:109

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 306 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...306

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:109

```
ggcatatcca tggtgatgaa caaatatccc cacgtacgtg ccgccctttc tggactgagg      60
agatcgctcg tttggctcgt cagcacaatg atgccaactc ctctcgctgc ctgcacgctt     120
catctcggac gaacaggcca aagctatttg aaaatctatt tggagacgcc ttttgaaggg     180
ggacgccaca aggcccaata gacaaaattc ccatccggaa gtagtactta acccaacaaa     240
```

aaaccagaaa taaagcaatg aatatcgata attcttccac aacgattcag ggaagaccat   300
cgtcgt   306

(2) INFORMATION FOR SEQ ID NO:110

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 619 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

   (ii) MOLECULE TYPE: DNA (genomic)

  (iii) HYPOTHETICAL: NO

   (iv) ANTI-SENSE: UNKNOWN

   (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

   (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...619

   (xi) SEQUENCE DESCRIPTION: SEQ ID NO:110

ctgaaatgga ctatggcgtt tgggaaggac ttcaaaggga ggaggtaaag tgcaattccc   60
tgaattatat cggtaaatat gaagaagacc cctttcatat tatccgaaaa ggggagagaa   120
tcctttcgat gtccaagaac gagtcagaga ttttgggaga gagagattct ttcactacca   180
agcagcgtca atcaagtgtt atagtgacac ataaaacaac aggtagaata ttattgaata   240
atgtttagag ggaaaggaat cctcttttag ggggagacag atggataatg cctcgttgca   300
aagatctctg taaaactagg aattgtagaa gtcgagtatg agataatcga gtatttctct   360
cttaataact gatattttaa tggatattca aagatagcga agttcttcga gcagttgcaa   420
aatcaagatt ttgctcaatg gaggattgtt tcggtaaata tgacgttgaa ttttctgatg   480
atacagctga acttttctc agtcatgtga tcatgttgtg ttgttcaata acagactcac   540
aaagtcatgt tgctcaaaac atcagattcc atactgtcaa ttggtggttt caggctcata   600
ataggggggaa gattgaagc   619

(2) INFORMATION FOR SEQ ID NO:111

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 556 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

   (ii) MOLECULE TYPE: DNA (genomic)

  (iii) HYPOTHETICAL: NO

   (iv) ANTI-SENSE: UNKNOWN

   (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

   (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...556

   (xi) SEQUENCE DESCRIPTION: SEQ ID NO:111

ccccggcatc gaccatccga tagcgatagc ccggagcaat cagaatctcg tcggaaaaat   60
cagcgtttcg actccttgct cgtccatcca atcgagtata tgcggatggt ctcactacga   120
gacagggcca catcttcatt ctcatagctt cccactgatt gacttttaag gattcttgcg   180
atgtatgcga agcggagaga ggcttcttcc ccagccaata gagactttcg agcgtccgta   240
cggagtcgtc ccaacggcaa cgatgctgcc ttgccaatca cgcagggctt ccaggatgag   300

```
cgctcaatga ctatcagttc acggtgcatc cggtgttcac cgaagtctcg cttttgacgg      360
gacggaaagt gccggctccg acatgcaggg tacatcgaca accggagtac cctgtgctct      420
cagccgttcg aactcctcct cgtgaaatgc aacccggccg taggtgctgc caccgaaccc      480
agattttttgg atagacggtt tgggtaggtt tccaagtctt cctcttcggt atcccgatta     540
gatagggggg aattag                                                      556
```

(2) INFORMATION FOR SEQ ID NO:112

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 554 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...554

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:112

```
cgggcagaat gttcatgacg gccagcatga tggagagaag tgccgtcatg cccagaattg      60
aggccagttc caagaggccg ggaaaaggct gcccaatgcc cgaagccacc tatctgtcct      120
gccccttctt tggtgaagac gtacttctgt cgcttacgta gctgcgcatg gtgcccatac      180
cttgtgctat tccggcggta tggcttcgaa tagcgaatat cggatatgat cgatggtata      240
gatggatcca acggtcggag gctcactccg ataagtccgc cggtatctac cggcgcgtta      300
tagtcagctc ttcgcctgct cgggctatgg acagggctat ggttcgcctg catggctgcg      360
aatggctccg atcacatcgc ttgcatcagg cacaacttgc catttacggc agtgatactg      420
tcgcccgctt tcagctgaca gcataagccg tcccttgggg catgacgcta tcgatgacga      480
acggcacctg atggacataa agccgctgtt ggctttgagc acacgcttca tcatatcgtc      540
ggaacatgta cgat                                                        554
```

(2) INFORMATION FOR SEQ ID NO:113

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 3038 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...3038

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:113

```
gacgtgtaac gttcgccgat cgagccgtca ttttacttcc aaaacgggca tgaggctttc      60
ataaatatca gccggtgtct tggcatagag aaagacggat atctgttctc agtctcgtaa      120
tgattgccct cggtcagggc tgtctgatga gcagattgtc atcctccgtt tgaagaatgt      180
```

```
agaggtaatt gaagtaccct gtttcatcat gagggtacga gtgtacatct gctccgaagc    240
atcatgaaaa gctcgcgttc gctcatcggg agaaaatcga aagcctctcc ggacaaagga    300
ccggcccccgg caacttttca ctctcgaaag agaagataac ctctaatagt ctccttcggt   360
agcactatta gcaccatcgg tagtacgaat gaacgtctac cgaaattgtt ttgttcgaac    420
tgatagggta atccggctct gttttgtcgg gatacaactc catcacatag tgcccgttgc     480
gcgagtaaga cggtacaccc ccataccatt gtaactatcg ctgagcatct ctgccttccg    540
taaacattgg ttgccggaaa taaagctccg gcatgctgat catatacatg gtattacctg    600
caatactcga aggtccggag agcgaacgca tctcggatcg cgcccgtttt gtcccacgac    660
aagggtaagc tcctccgagg gggacagatc cgtaagccct tcagatctac ctcaacattg    720
acttgctgat gacgacgtgt atatcttcat aagtaacgga cgtttgcaaa cccttgaggg    780
aagcaacgga actaccacac gaaaggcgat cgtaagaagc gtttcgtccg gatataaacg     840
tcgaatacgg tcatgagata attccccgag agcttggggg tgaattcgca ttgggcaaag    900
acagttcgta atgaacatag ttgaccaaag tgctctgcta acggcaggcg gatcgaattc    960
gttctccaga aagccggaaa agcttcagcc ggagaaaccg gactcgcctg ccaatcgtga    1020
ccacagtgcg cagtctgtat cccagcgtca tactctcatc gcccataaga tcaaaactat    1080
ccggagtcct tccccactat ttatatggta gtagggatat agcctcactg ttctgtgcct    1140
gtaggagtaa caagaagcga ctgcactcgc gaatcaaagc tcgggtctgg ccgacagacg    1200
gcaccgacca taagaaggaa agaaaagaaa aaaatgagac agacgaaaag aaaactgctt    1260
catactttat aatgtaagtc aaacaaagat aaggtttttcc cccccttgttt gggaagctcg    1320
gagctcaata gcagattgat gacctcgact cccttgtcgt atttgaagca ccttccttat    1380
aatagaaaga tacccgtgat tgtaatttcc aatagtaaga gaacagagac tacagaaaat    1440
tccccgaaga ggccggcctc ttcggcaggg gctatcgcat ttgaaaggtt gtactccgcc    1500
ttggtctctt ccttctacat taggatctct aacacattaa ttcgtgctta ttccggacgg    1560
agcatcatag gctatatgtg tgttaatact tcaaatgcga ttgccctgat gagaaagact    1620
gcctgcatgc ggatcggcat gcagccgtaa catacaaccg tagtacattg cgctcttacg    1680
gagtcgggtc gtgtaagaga atcgatgccg ctacggcttc cccggctctc ttagtacgaa    1740
gccgccggcc atcgaaatca tactgaagat aaggccaagg ccttgcgtcg tcaggactg     1800
gcgcagatat tgaagaggtt gttatagtgg ttgtaggctt taatacgaat ggagccggac     1860
ggttgatttt atattcggca tcaaattcgc ccacataggt attctgtaga taggattgtc    1920
ccgatagccc acattcccgt tgataaggag acggttattc gcaaacgact actcaggagc    1980
agttctatat cggtgtcctg aaaagaggtt tggtcgtctt gatgctcgtt cctatctgca    2040
ctttgtcact aaggcttcga gcatattggt gagctgctgc gacagagtgg tggtggccac    2100
tgccgtcagt tgtctgtacc gcttcccgaa ttatagacat tctccggcgt ataaaatttc    2160
ctaagacaag aagataaacg atctgcttcg tcatcgaatc ttcgcgtgga tgagactgcg    2220
aacccgacgc tccaattcgc tgtcggagtt gggtgcttga tgtcgaagct gacagcaggc    2280
tgcaacatgg caccattgat ctgagcaggc aattcaccgg aatggtagtc cgtctgacgt    2340
cgctcacgag agttcgtcca agtcgttcag attggctgtc agattgtatt cggccgttac    2400
atcagagttg cgtgcatcgg attgccggca aaattcacac tactgccttc ttgatgctga    2460
aacgtttttg gacaatctgc cggaggttga aattataagg cccgacaaca gttccagccc    2520
tccgaataca ttcagatccc ccaatgtagg taatcgatac gcaaatctcc accggctgat    2580
ccgcgtaagc catcgccgtc tgcggatcca gtatcaaatc cacctctgca tccggtgtca    2640
cgcctaattc atgaccaagt ggaaatccgt ctccggatct cctcccgtag caggtgaagt    2700
agagaaggac gatccggcga agtttcttgt ctcgctcgct cacgctgctt ttcggatcta    2760
cgaatcgcaa gaaacgatac tcttccgctg tcgaggctgc gtaaagttca gcacgatatg    2820
ggttcctttt tcggaaatca gatgacgtcg catctcatcc ctccgggcac atcgcgcaaa    2880
tatgcagcac cgacacataa acccggccat gtatattgng gttgtcccgc tccggcacgt    2940
ataagcaagt atattacgag cttcactgac tttcagatcc actttgatgc atcgaaagcg    3000
cgatgcgaga tatgtgcatt gagtcggccc gtatgccc                            3038
```

(2) INFORMATION FOR SEQ ID NO:114

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 764 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:

(A) NAME/KEY: misc_feature
(B) LOCATION 1...764

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:114

```
gcgctatagc cgtctttctc caaagtcttt acttgcgtaa ccacacaaga ccaacttcga      60
taacagtgca tggcagattc ttgccctcgg cactgaatcg gatgtcattc cgattttctt     120
tcctaataaa cctggcattt cagttttatt aaacgtttct caaactttga tttccacttc     180
cacaccgctg gggagtccaa tttcatcaga gcatccacag tcttggcagt agagttgtaa     240
atatcatcaa tctcttgtat gaagagagtt cgaactgctc acggctcttc ttgttacgaa     300
cgtagagcgg ttcactgtga aaatccgctt atgcgtgggc agagtatagg accgctaacc     360
atcgcaccgg ctgctttcac cgtctttacg atttctcggc agacttgtcc accagcatat     420
aatcgtaaga cttcagctta atctaatctt ttggctcata tctatgttgt tcttttattt     480
gatcaaatca cgcgaccctg agcttcggta agcacctgct tagcgatggt agagggcact     540
ctgaatagtg agagaaggtc atcgtactcg tagcacgacc gctcgttacg tacggagagc     600
cgtcacatag ccgaacatct cagccagagg caccttacct ttacgatacg tgctccggta     660
cggctgcttt ccataccttc cacctgccgc gacgcttgtt caagtcgccg atcacatcac     720
ccatactctc ttcggagtca ccacttccag tttcataata ggct                     764
```

(2) INFORMATION FOR SEQ ID NO:115

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 529 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

   (ii) MOLECULE TYPE: DNA (genomic)

  (iii) HYPOTHETICAL: NO

   (iv) ANTI-SENSE: UNKNOWN

   (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

   (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...529

   (xi) SEQUENCE DESCRIPTION: SEQ ID NO:115

```
ggcgaaagaa acaccgcagg acgataagga agctttcctc ttcaacgtac ggttccgcgc      60
gtactctctg tcttgggaac tcgcaacccc agtggttagt accgggtatc aacaacatcc     120
tcgaaggcgg ctatgtaaag gccgatgcac taccgctatt ccggtggata gtatgatgca     180
gcgcggacgc agagcgtcat ggctcttgac cgactacagc aaggccaaac aagccggcga     240
catggagctg ccctacagca caaatccgtt atagacgaga atttcccota tttcgctata     300
gctatatcca gcacaagaac gacatagttc ccccgttgg gctacctact acagcttccg     360
tatcatggtg ggactcggta tgctgttcat ccgttattcc tcatggcatg gctcctgagc     420
ttcaaaccgg aaaaattcag caaatgcgat ggttccacat gatcgctatc gtatgtatgc     480
ctcttgcatg gtagccagtc agagtggctg gatcgtaccc gaaagtgga                 529
```

(2) INFORMATION FOR SEQ ID NO:116

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 857 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

   (ii) MOLECULE TYPE: DNA (genomic)

  (iii) HYPOTHETICAL: NO

   (iv) ANTI-SENSE: UNKNOWN

```
    (vi) ORIGINAL SOURCE:
         (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
         (A) NAME/KEY: misc_feature
         (B) LOCATION 1...857

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:116

gacttggagt ccgggcgaaa gagcgaagag gaattccgaa ccgagctatc cgatacatag        60
gaaaagaatt gacctatcag caggtgtacg atgctctctt ggttttcttg aggagatttc       120
ggccgaaaag ttcgattata tcgactccta cgccccgatt atcgactctt cctcctctcc       180
aacaccaatc cttatgcctc gatttggcca tgagtccgcg ttttcttccc tcaggaagga       240
cgctgatagt ttctttgata aagtctatgc cagttgtcag atggggaaat acaacccaat       300
gaagatattt tcctcgaaat gatagccgac agcggtatga agcggaggaa accctcttca       360
tcgacgacgg accggctaat gtggcaacag ccaacgactc ggtttccaca cctattgccc       420
cgacaatggg gaaaactgga tcctgccatt actcgactcc ttcgcgaaca gaaataaaga       480
agggctgtac gcgaatcgtt tcgctccgta caagccccct tttcgtatcg aaagaacgtt       540
gcttatttcg taggctcttg catcgtgaag tccacgttca gcttattcga tccagtccgt       600
accagttgcc tgtaatagca tcgatagcca cgggaataga ccaccgagta catccaatac       660
cacccacttg gcttccacac ggttgtgatt atacgtatga tgggctgttt acccggaata       720
cgaaattcca cggtgaggat ttgtcagcct tgagcgagag ttgcaagggc gtttgtccca       780
tctttcacca ttgatgtaaa cttctgctcc ctgtgggttg gaaaccattt ccaagcatgc       840
gtctgtttgc cgaaaag                                                      857


(2) INFORMATION FOR SEQ ID NO:117

     (i) SEQUENCE CHARACTERISTICS:
         (A) LENGTH: 377 base pairs
         (B) TYPE: nucleic acid
         (C) STRANDEDNESS: double
         (D) TOPOLOGY: circular     :

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
         (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
         (A) NAME/KEY: misc_feature
         (B) LOCATION 1...377

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:117

gtcagatttt tttctttata aaatccctga cagatgttta cgtatttata atgatatgga        60
gaccgtggta gcaaagatta tttttggagt aggtaaagtg gtttcgtcta tgtgcgggtc       120
aattccggac agtggaagtt gcattattct atcgcgatta tcaaggcagc gtgacggata       180
ttaccgatgc ctccggacgg tggtacaccg catgcgatac agcccatggg gaaaattact       240
gcataggatg gtacacctta tacccgaagc gaagagttat ccaccgacta tgacggcttc       300
tcttccttgg acggggttat acagggcacg agtatcttcc ctgtttggat tggtcaatat       360
gaatgcccga ccgtcca                                                      377


(2) INFORMATION FOR SEQ ID NO:118

     (i) SEQUENCE CHARACTERISTICS:
         (A) LENGTH: 879 base pairs
         (B) TYPE: nucleic acid
         (C) STRANDEDNESS: double
         (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)
```

(iii) HYPOTHETICAL: NO

(iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
  (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
  (A) NAME/KEY: misc_feature
  (B) LOCATION 1...879

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:118

```
tacacancag caccacgaag tggcgaaatt tccgcatatg cagaaatatt tttcgtatat      60
actccgataa attttcgtat atacgggaaa taaatttctt atatacgcaa atatatttct     120
ctatatacac aataaagaga ggctcggata ttgctctgga actctatagg agaatgaatc     180
cagagcaaag ggctaatctg cttgtgtaaa cctaagggga aataccgatc gacagttgta     240
accccgcata ggactaaccg gtatgtctgt aaacatatat gaatcccgcg cacccaactg     300
tcaacttttt tcagtacaca acagtttgcg agaatatccc tactttacac gtaaagaaaa     360
tagaaagcaa attttgatga ctacgtccct ttcaacaacg atgacctgaa ccaactggaa     420
tctaaaggca tcacaccgga aaagcaatgc gccaggtaga agctctcaga tatggattcc     480
cgtatcccaa atcattgcac ctgcttcatt agagaatgga atcatgcgtt tggatgaagt     540
gacaaatccg cttatctgtt ggaatgggac agatatttga atagtccgac tgcaacgttg     600
tcaagtttgt accggcatcc ggtgctgctt cgcgcatttc aaggatttgt acaacttcct     660
tgatgccgat tcaatgagcc aactacgatg cagagaaggc gttctttgca caccttactc     720
gatttgcatt ctatgctccc ttaacgagac atgcctgcgc aatgcttggc gcacagtgcc     780
caaatcatag ctttcaaaga atacaagacc gtggtggaga atctgctcta tccaaaggtc     840
ttaactatgg caatcttccg aaaggttgct tctctttca                           879
```

(2) INFORMATION FOR SEQ ID NO:119

  (i) SEQUENCE CHARACTERISTICS:
    (A) LENGTH: 2464 base pairs
    (B) TYPE: nucleic acid
    (C) STRANDEDNESS: double
    (D) TOPOLOGY: circular

  (ii) MOLECULE TYPE: DNA (genomic)

  (iii) HYPOTHETICAL: NO

  (iv) ANTI-SENSE: UNKNOWN

  (vi) ORIGINAL SOURCE:
    (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

  (ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...2464

  (xi) SEQUENCE DESCRIPTION: SEQ ID NO:119

```
ctatctgcat tgtataggtg nataccgcag tatgattgca tccagcatct actctcgcga      60
ggctatcgta atttcacgga catcgaaggc ggattcgcag cattgcgcag accggtgttc     120
ccaaaacgga ctatgtatgt caaagcaagt gtcaaaaaaa taatatcgtt ttccttaacc     180
atcattatcg caattgcatg ttaggattac tgaaaaatct attctcgcag tctgacgata     240
aggcttgagt gaggctattc gcaacggcgc ctttctggtc gatgtgcgta cgccggtgaa     300
tttgcatcag gcagtgtagc cggagccgtg aatattccgc tggccggata gcatctcgcc     360
tgaatgaact caagaataag aagaccatca tctcttctgt cgcagcggca acagaagcag     420
ccaggccaag agcattctcg acgcaacggc ttctccaacg tactcgatgg aggcacctgg     480
gggcatgtag ctctctgaaa ggcgatcagt gataacgaag tctgagaaag acttcgacct     540
tacaactctt tctctattaa gaaggattgg tttttgaatt tttgtcttcc gaagacaaga     600
atatcatcat aaaaccaatc cttttttaca tcatataatg aatcctattc tcttttactc     660
tgctgtctat agcatgcaaa aggtctaaaa tccgatatta ccgctttcta taccctataa     720
atcacatcca aagcaggcaa ttgcatttga aatataggtc tgatgatgtt ccgtccggaa     780
taaaacgaat taatgtgtta gagatcctaa ttgtagaagg aagagaccaa ggaacggagt     840
acaacctttc aaatacgata gccccctgcc gaaggggccg gttcttcggg gaatttctg     900
```

```
tagtctgtgt tgctcttact attggaaatt aaatcatggg tgcctttcta ttataagaaa    960
tgagtcctga tcttcccaaa aagggggaaa aatgaatttt gaagacgcaa aacagggaaa   1020
acttccaagt tattttcatt tcaccttaat tggccataat gtactggtaa ttagcatgtg   1080
taacgagcac cgtacgccta cgccggtctc ctgcaccgtg caggagacat cgtacgccta   1140
cgatcgtaag tgtttcgtac cggcttttca acacttttcg tattcctctg cataatcttc   1200
aatctcgtac cagaggtatc acctggagcg tagagaggaa aacgatcagg aataaaaagt   1260
caagaggata aactctttgc tctctatccg tgggtccgag accatgaaga gattttccga   1320
taggactgaa tacatgactg acggctcatt caacgactat aaaatttata gacgctgttt   1380
tgaatgcctc tgccctgaca tccaaagtga tgtccttttc ggatcagcct tttcctaatt   1440
tcttttcgat ttttttttctc cgggatgtaa agacatggat tgcatcaatg ggcacgaaca   1500
tgtcgatgag atcgaatggt ccgaattctc tcgttttttcc gatatgtatt tggatttgct   1560
ttgctattga cagtctaaga cccttttttag gcttttttgc cgaaaaaatt acggagaaat   1620
atgctacttt tgtggcattg tacaaacaaa agattaccaa ataatgatat gatcaacaga   1680
cgcatacgcg tacgtttcgc tccgagtcct accggccgtt gcatatagga ggggtacgta   1740
cggctctata caactatctt ttcgccgtca gcatggaggt gatatgatcc tgcgcatcga   1800
ggatacggac agcacagatt tgtgcccggt gccgaagcgt atataataga ggcattggaa   1860
tgctcggcat caaattcgat gaaggtgtag gctatggtgg ccgatttggc cttacaggca   1920
gagcgaaagg cgcgatattt atcgcacata tgttcgccaa tactggattc gggacgggca   1980
tatatcgcct tcgatacgcc ggaggaactg aagctcggcg agccgaggtg cccaacttcc   2040
aatacgatgc cactactctg ggcaaatgcg caactctctg acactgcctg ccgaagaagt   2100
ggagcgttcg ttgccgaggg gacgcagtat gtggttcgtt tcctcgtgga gccgaattgg   2160
acgtagaagt gaacgacctg attcgcggac gagtggtgat caactttcca tcctcgatga   2220
caaggtgctg tataaaagtg ccgacgactt gcccctacc atctgggtca atattcgtgg    2280
acgaccattc tgatggaaag tgaccatgtg atacgtggtg aaggagtggt tgcccaagtg   2340
caccactttc atgtactgct ctaatcgtgc ttttcggttg ggaagatacg aatgccgaga   2400
ttgcccattt ggcactggct gcttgaagcc cgaaggaaac cggtaagctg agccaaacgc   2460
gatg                                                                2464
```

(2) INFORMATION FOR SEQ ID NO:120

        (i) SEQUENCE CHARACTERISTICS:
             (A) LENGTH: 475 base pairs:
             (B) TYPE: nucleic acid
             (C) STRANDEDNESS: double
             (D) TOPOLOGY: circular

       (ii) MOLECULE TYPE: DNA (genomic)

      (iii) HYPOTHETICAL: NO

       (iv) ANTI-SENSE: UNKNOWN

       (vi) ORIGINAL SOURCE:
             (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

       (ix) FEATURE:
             (A) NAME/KEY: misc_feature
             (B) LOCATION 1...475

       (xi) SEQUENCE DESCRIPTION: SEQ ID NO:120

```
ggcgcagaag gctctgccgc atgtgtccac cggagcggat gcccttgtag gcggaaagtg    60
ctggtgacgg aaaccataga tccgacgacg gacaaaggcg cgtggctgtg gatggagatg   120
tttggacggc tcgctctctg acagggggggt gatagaaaag ggtatgcgtg tggaaatcgt   180
atcttacgaa agcatttcct gaatgtagtg gttcttggta acgacaaaca ataataatcc   240
aacaaaaaac ttatttcatt atgacagcaa caggatttat ccttgcggct ctgacattct   300
tgtgatagcc attattgcca atggcttgaa gatcgtgcag cagccgagac catgatcatc   360
gaacgacttg gcaagtatta tcgtacgctc agtcgggagt caagtatcat catccccttt   420
atcgacaaac cccgtcccat agcaagcgca tcgcttatac actacccttc ggaca         475
```

(2) INFORMATION FOR SEQ ID NO:121

        (i) SEQUENCE CHARACTERISTICS:
             (A) LENGTH: 2649 base pairs
             (B) TYPE: nucleic acid
             (C) STRANDEDNESS: double

          (D) TOPOLOGY: circular

     (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

     (iv) ANTI-SENSE: UNKNOWN

     (vi) ORIGINAL SOURCE:
          (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

     (ix) FEATURE:
          (A) NAME/KEY: misc_feature
          (B) LOCATION 1...2649

     (xi) SEQUENCE DESCRIPTION: SEQ ID NO:121

```
tatgaccaat gctataagat actgtcttct attcataatg ttgctgatag attcaatcaa    60
tggttacatg ctcagcctcc acttcctcct taaggaaagg gatgccaatt ctccaaattt   120
gtccggactc tccgtggtgt agtaggagtt ttgccaccct tctcaatgcg tctgtccatt   180
tcggggtggc gactgaatag tctttcaaag aatgcgccac aagttcaccc tgtgctatga   240
gcttgtagta ggcgtaagca aacgcttcat cttaggacgc aatagaggat aatggtgcac   300
gccaatataa tcgtatcgat ggtatcatcc ttggcaatga tacgtccaga tgcttgcgaa   360
tgaaatagtc agcccccggg ctgtcacttt cgccgtttcc acgagtggta cccacatcgg   420
acacgcctct tcggtgactg aatttcgggg aacaattttg cgatttcgag ctggtagcta   480
tgcgaactaa tgtaccttgt gtggccaaaa cacctacgtg cttagtcctt gtgatctcac   540
tacggcttca accgtagggc ggatgatacc gaggacacga cgggtgggtc ctccatattg   600
ggcagatcgc gttgctgaat ggttcgcaag gcttttgcga tgccgtatta caagcgagaa   660
tgactagcgg acaaccgagt tcaaaggctt tctcacagcc tgtagcgtga atttgtaaac   720
tacttcataa gagcgttgcc ataggagag cgggcattat cgcccaagta aacaaagttg   780
tactcggcat gagtttgcgg atctcactca agatggtaag tcctccataa ccgagtcgaa   840
tatgccgatg gatgggttca tgttgatgct tttatcggag gtaaggtacc aataattggg   900
ccgccagtat attccgcctc attatttttt acagaaacga ccagcataac gatgccccca   960
tagggtgttt ggtgctcgaa caagtctcaa gctcatataa gcccgcataa acctgagcac  1020
aaagaatagt cccccatgcg tgaagatagc tatatgcccg aacggcatcg cagtcaccct  1080
tccagaaaat tgcttacgcg ttccagctgc atgacgaaac tctcgccccc gttgcaggtg  1140
ttcgtagata atccgcgtaa taatcttgca agcgagatcg tctatatggt catatcgctg  1200
catctcccac aaaccgaaat taatcccatc agtcgtccgt cttgtatggc atcaggataa  1260
ccgcaaaaat gagcaaacgg gcacaacggc tgagcggact cgtatagaca gcatcgaagt  .1320
ccaccccgat agccggcggc gtacgacctc ggcctcttct tcaaaggaag ccgtaggggt  1380
acatcggatt gcccgtagca tattccggca gggacatccg ggtcgtgtgg cggatgagag  1440
taatctgcat cttacaattc tatgatccta tcataataag cattcctacc caaaaagaca  1500
gctcacagag aagaaaagtg ctccgcagca atcgcctgta taaccgccta tcttccgctt  1560
cataagacgc gcagcaagag gaaagccaaa atggggatca agactgccgg ccaataagga  1620
gtggaaggaa gagggccaag ggtaaagctc cggcagagaa tgagaccaaa aagtcaagac  1680
acccatcgga ctgtatatgg cttgcacctt actctatcct cggaacgggc gtagggaagc  1740
gtattgatga gctgggaggc caccatttgc acagaggatc gcccacacct aatgcgacaa  1800
gcgtcaggat cggggggagag aagacagaga atagatccct atcatgaagt aaaagatgaa  1860
ggcagaatac cataagtacc cgtatgcgaa tctttcatga tagccaagat ggctccttgg  1920
ttcgccctgc accgaatcca tcgaagaaat cacccaatcc tcctcatgga aagcccctgt  1980
aaagagaacg cgagagagga gtgcaaggga acgaccatag tgacaggaag gtcgatcagt  2040
agtcccaagt ggcagattga accatcagtc ctcccgtaag ccaacccacc agactccaat  2100
aatcggtgcg cgcttgaaag cagcatcagg gacactcacc aaacgccaca gcggtagcgt  2160
gtgagcagca taaatgctgc caatattcgc tgatatggtt ttgccgcttt tccttcatga  2220
acttttagaa atacttagtc acagccgctt gagcaaagta tgcatttcgt tgatcatgct  2280
gacggccgat actatgatgg ggttgagcac accgctccgg aaccttctcc caagcgaagc  2340
cccagattca gagaggtttg gccttcatat actccagcag gcgtgcatgc cccgattcgt  2400
cccgcagtga ccgaatacgg catagtcgca gacttcggga tagaactgcg tgcagcaagg  2460
aggcaattgg tcatgatgaa tccatccacg atgatcagct ccccaactct gccgcctgaa  2520
gcattccccc aacggccatt agcatctcaa tcctccaaaa taagtgatga cgtcctcggt  2580
cgatccgttg cctttatgtt ttctttggcc tgtttgagaa tgttatactt atgtctgact  2640
ccctccaat                                                         2649
```

(2) INFORMATION FOR SEQ ID NO:122

     (i) SEQUENCE CHARACTERISTICS:
         (A) LENGTH: 513 base pairs

```
    (B) TYPE: nucleic acid
    (C) STRANDEDNESS: double
    (D) TOPOLOGY: circular

 (ii) MOLECULE TYPE: DNA (genomic)

(iii) HYPOTHETICAL: NO

 (iv) ANTI-SENSE: UNKNOWN

 (vi) ORIGINAL SOURCE:
    (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

 (ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...513

 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:122
```

```
ggagtagtaa ttcctgaaat ccttgagctt ttgcagaaag tcgaacaggt gctcttcaga      60
ttgtccaagg agagcgcgtt ggcttgcagt tcttcctttc tttttttgtg agttctttct     120
tcttggagga tttgtttccg gaagattgct ttcgaagagt ttcttgccgt atgcggctcc     180
ttccaaaaag gagaaagctt caggatcaaa cttctcagcc gagctttcct ctccagatcg     240
ttgtcaggtt tttccattgg cccttgaaga agagtatatc ctcatcgttg gttaatcggc     300
cttgctgtag gcgagctgcc tgtcgatgtg ggcgagggta ataaggcgtt gtgacgtgcc     360
agattgaaga aagctgccca gaaatgtttg tctccagcgt gtagtaggta ccgttgtacg     420
gtttctcgtt ttgttctgtc aattctaaaa taagtggtgt ggatcgataa gcaggcctat     480
cgggtttcgt atgcgcccga atgcctgccc gtt                                   513
```

```
(2) INFORMATION FOR SEQ ID NO:123

    (i) SEQUENCE CHARACTERISTICS:   :
        (A) LENGTH: 527 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

   (ii) MOLECULE TYPE: DNA (genomic)

  (iii) HYPOTHETICAL: NO

   (iv) ANTI-SENSE: UNKNOWN

   (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

   (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...527

   (xi) SEQUENCE DESCRIPTION: SEQ ID NO:123
```

```
gagatcgttc agattgcctg tccccaagta tttacgggtg tactggacgt gcctccttcc      60
acttgatcaa cggatccgaa ctggtacccg gatgcggata aggaagcact cccgcactca     120
tagcaatgga tttggaaata ggaaaaacat ggcgaaatac tcaatgtttc ccattttcct     180
attgtccttt ttcccgtctc ggcataccac gtaattccgg tagatgcacc gaaatcgaag     240
ataaagtcat cgaatccaca gccgagtatg aagcaggatt gacggcattg acgttgtgcc     300
ctgacgcaga ccgacgccga gtcctcccat ggaatgccca ctatagtcgt ccgttctccg     360
agacggccaa ggccgaagcg agtgtaaggc gatcggtaaa gttgttgttc tgagcctgta     420
taccgtctgc tgcaaatagc acccaatgat caggcatac caccgaagcg acgcatacaa      480
acccttatag ctttatacat tatattctaa aattctattt angccca                   527
```

```
(2) INFORMATION FOR SEQ ID NO:124

    (i) SEQUENCE CHARACTERISTICS:           *
        (A) LENGTH: 474 base pairs
```

```
     (B)  TYPE: nucleic acid
     (C)  STRANDEDNESS: double
     (D)  TOPOLOGY: circular

 (ii)  MOLECULE TYPE: DNA (genomic)

(iii)  HYPOTHETICAL: NO

 (iv)  ANTI-SENSE: UNKNOWN

 (vi)  ORIGINAL SOURCE:
       (A)  ORGANISM: PORYPHYROMONAS GINGIVALIS

 (ix)  FEATURE:
       (A)  NAME/KEY: misc_feature
       (B)  LOCATION 1...474

 (xi)  SEQUENCE DESCRIPTION: SEQ ID NO:124
```

```
tcgttcatct  tctcagaaga  aggaatatgg  atatgccaat  atcttatata  tggttacttt      60
gctaatagat  aatcagttgg  gggcgattat  tcgtaagtcc  agaattttga  agaactttct     120
gatttgatta  gtaaacaagg  attaattctc  gaaaattagc  atctttcgga  ccatatttca     180
taaatgctat  ggtaatctca  agcaaagtaa  ggttatcgct  atatcaggcg  atgttgtgca     240
attaatgatt  attctttttcc tgatgagaat  ttgcgttcta  agcgattgga  gagattatca     300
atgataccaa  tgtttttattg gatatgtgta  gtaacttatc  ttcaaagaaa  tttataacaa     360
attgaatgta  caattatgaa  tctatatatt  gcagcataaa  agttgtggtt  caaggggttt     420
aaagaaaata  cagaaagatt  cataacctac  tcgttcgaac  caaataaaat  taat           474
```

```
(2)  INFORMATION FOR SEQ ID NO:125

       (i)  SEQUENCE CHARACTERISTICS:
            (A)  LENGTH: 1023 base pairs
            (B)  TYPE: nucleic acid
            (C)  STRANDEDNESS: double
            (D)  TOPOLOGY: circular

      (ii)  MOLECULE TYPE: DNA (genomic)

     (iii)  HYPOTHETICAL: NO

      (iv)  ANTI-SENSE: UNKNOWN

      (vi)  ORIGINAL SOURCE:
            (A)  ORGANISM: PORYPHYROMONAS GINGIVALIS

      (ix)  FEATURE:
            (A)  NAME/KEY: misc_feature
            (B)  LOCATION 1...1023

      (xi)  SEQUENCE DESCRIPTION: SEQ ID NO:125
```

```
ggttttaccg  tggtctacgt  gggcaatgat  ggcaatgttc  ctnatgtcng  cattttcttc      60
ttctgagtaa  ttggggacaa  aggtagtaaa  acgggctgtt  ttcggaatgg  atatccaagt     120
gttcggattc  tgcacattcc  atctgcagag  cgttgcattt  gcaggcaaaa  aaagacgccg     180
acgaaagtgc  tctcatggcg  tcaataggat  tccaagatat  ctcttgatag  agttttttcag     240
ctgacatatc  cgtcttacag  gatgatgttc  ttagatgtct  gtgtattatc  agcaacaaaa     300
cagtgacgag  aatatggcct  ttcgtcttta  agtcgataca  aaatctctgc  cctgtgtctg     360
actcgtggca  aaaagcatcc  gtcctgccat  atataaatat  agaccgattt  gatcagtttt     420
tctgccttga  tgccgatggt  cttccttgga  tgtagacgtt  tatatcgttc  gacgaaggta     480
caactgtttg  ctatctgtcg  tatggcatga  tttggcaacc  gtgctataga  agataatgga     540
tacttcagct  gataatcctg  cacaatgtct  ccctctaccc  tgacgcgctt  ggagggggat     600
aggagtttcc  ggctatcatt  acttctccgt  tttcactctg  ataaagttgc  cttcgtcatc     660
tttgattgcg  atctcgaagc  cgctgtgtct  tttacgcaaa  caatagtcgc  tgtcacttcc     720
ggatacgtaa  attgcgcata  gggatctcgg  taaccactcc  ctcgaaagtt  cgattgggga     780
gagtatgcgt  gtgcacatca  gttcatagta  ggcatcgaat  tcatggaaac  gacttctgta     840
attagcatat  cgcccaactt  ggcgtatgga  cagaactccc  ttacccccca  taataagctg     900
taggataata  ataacctttt  ccctgataac  taatggtgct  ctaaaggcta  tcggttgtca     960
```

aaggcattca gttgtgcatc cagaccatcc ccagccgagt gataatcgac cgggactgtg 1020
tcg 1023

(2) INFORMATION FOR SEQ ID NO:126

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 444 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...444

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:126

ggcgcatttc ctccttcacg gtttcatcaa tatccaatgc ttcgataaac ttgcaatgga 60
ttcggctgtc accgtctcat tcgtacgcgt cagagcctca acgtttcgta tggattggga 120
tacccttctc tacgaagaat agtttgttag cctcagccac cacagcatag ttgttctgca 180
aatcccgatc gagagcgctt cgttgagaag cagtttgcca agccctttgg ctatgctcgt 240
gactgtatga gagaatgcgc caaaggagtt ccacgttacg aagtacagtg gaatcgtcag 300
atctcgctgc aagcgggaaa taggcaattt gcgcgacaaa tgccaaatat ggcattcgca 360
atacccagat tgccttcggc attttcatag gtgatcggat tcactttatg tggcatggca 420
gaagaaccga cctcgccgcc tgat 444

(2) INFORMATION FOR SEQ ID NO:127

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 553 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...553

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:127

ggctgctgtt ctgccagcac ttcgtcgagt gtctgataca gcctttggta aagagcagcg 60
caaagtcctg caaggcattc agagcgaatc cgatttgcat aagcctctaa aagaaatttc 120
gcccgtacgc tcgaatctgc gataggtggc aacttcattc ctgcccgtaa agcgattccc 180
tcttgtgtca gattcactcc aaccgtcggg cctttactcg ggaagcaacc tgcatagcta 240
cggacgcgga ttgcagtcta taagtgtcaa aatattatcc atacatatca aaaaatctct 300
ttattatatt atgttatcac tttcgaagat aataaaaccg ttcaaaaaca caatcaaatg 360
gactgaacca ccaaacgact agaatctgtt tttaatttat cgtaagagat tgtccagtgc 420
tttttcaagg gtgacatact aaacgatag cccgaagaga tgattttttc ggccgatacc 480

ctacttcctt cagtagaatg gaagcccgct cgccgaatac gcgacaaata acccatttgg   540
tatggaggga aag   553

(2) INFORMATION FOR SEQ ID NO:128

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 1555 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...1555

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:128

gcacatttcc gctgaagcta agattgttag ttgcataata ggaaagcgat ggcttacacc   60
ctgatttttcc tgtgcacgaa aagttttctt atacgtttct ccaagaccgg ttcgccggat   120
ccttttttct tttttatttc gaacggatat tctgccagcc atccgtatgg tagaagaaat   180
agttggtatt gctactaact taccgatgtt tatatcgagc gaagtattgg tttgccgatc   240
gttgtcttcg atatgcgatg tgacgtatat gcactcagtc gattcgtatt ctttttgtga   300
tcacattgat taccccggcg atggcatcgg atccgtagag cgactcgaag cacctttcac   360
cagttcgatc cgttcgatct gatcaggaga aaacgactca aatcggcctg accgcctaca   420
tcgccgtaca cacgcttacc acgataagga tgaggatata cttactgcta aggccgttca   480
gctgcatgaa gagcccatca gattggggcc gaagtcaaaa gacggactca gcccctgcat   540
aaggcctcgg aagtaggagc cgagaaagag gctatgtcct tagcggtagg acttccgttg   600
ccacaggagc atcgaccaag cggtaacgtg taccggtccg gtaacgacga cttcctccaa   660
gttgttcgtt cgcagtcgca atgcaaagag atcgttttgg tctgtccggc ttcgatggca   720
accacctcct ctttcgtcca tacccccca acgaacatat aatagtatgc tgccctgccg   780
gcagttcttg atctcgaaat gtccgccggc atcggcaccg gctactatgt tgggtgtttg   840
acttcgattc gagcaccggc aagaggctct ccggtttcgg caccgacaca ctaccggtta   900
aaacggcttt gctctgagcc gacagagaag agacaataga gcaataaaag agataatcgc   960
aaaaaagata gtttttgtcc cataatcgtt actaaaaaat gtcacataag agcgggacaa   1020
ggatgctgca agaaagagat catcggaacg aaccgatgga tcttgaaaac cgccgaaaat   1080
gatacattga cctgtttgcc taatcaaata tgcaaagccc aatgacgatc ggcagaatac   1140
gcctttcta aacactcctc aatccctgga gttctataga acaaatctac taaagcaggt   1200
cttctggctt agcttcttat cgggtttcgt cggccttccc ataggggact acgcccttct   1260
acagtgacca tcgcattgac tatccacccc atcacctctt gttcggagaa gtgacatcga   1320
agcttacagc tgagggctca gctccggaat tgcaccggat tcccttgcac cgcttcatga   1380
aagaaacggt tacttcagtc tttctcaaagg caaaagtata gtttttatatg aacgttaagc   1440
acagtacagg gctatcgcat ttgaatagtt tactgtatcc ttggtctctt tcttctctct   1500
aacacattta ttcgtgcttt tttggacgga gcactatcag gcttatatgt gtgtt   1555

(2) INFORMATION FOR SEQ ID NO:129

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 582 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
    (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...582

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:129

```
cgcctttcag tttcggcagg aatgattccc agtcgtcctg caagtcgcca atccccatgt      60
ggaagagccg agaagcagta catcgtattt cgctgcaggg cagcgtcggc atttgccacg     120
tccattacat tagcggagtc aacgcctatg cagaagcaat tttttgagcc agatcgctcg     180
tcgttccggt agaagaccgt agaagattcc gattgatttc atgtttttga atagtttata     240
ttggttgacc tgcgcaaaag tagaggagat caacgacttg taatatcacc acaatagcta     300
aaaagaatag gtccatacct atatgtgggg ggattcccat cgaaaaaagc agcccgacta     360
aggccgtgcg gaggcgaaag catagagacg gctacctgct cggccgtgcg ccggaggttg     420
tcccgtgcat aagccggatt ctcgcctctc taaggctgac gggagaagga gtaatcggaa     480
agaggccgag aaaccggcgc ggttaagagc tacagcatcc tcgatactgg ccggccagca     540
taccacgggt atcttctgct tcatagcctn agccaacaca cc                        582
```


(2) INFORMATION FOR SEQ ID NO:130

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 476 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...476

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:130

```
gaggatactg gatagtatcc attgacatac ttatctcctc gccattccac aatctccaaa      60
aaggagaagt acccccccgt acccggcata ccatctttct gatattggaa tgcattacaa     120
cccattcttc gaatcggtct ccgtagtttt atacttcgtt ctttgtttga agtactgcaa     180
tgcttctttg agttcgcaat aagccggttc aatatctcca tagtatattc aagaaaatgc     240
gatgtataga atgtgttgca tatttattcg ttgcctctgt ctgaataact tctgctctta     300
gctgatttcg atcggaattt gaaatgcaat taagcaattc ttttttgtg  taagttttta     360
attttatgtg tgctgttatt atggttctga ttggctattc taatacattc ttctcgtgat     420
tcttctatta tttgaatttt accggattgt ttganaggtt aagtaggggt agatgt          476
```


(2) INFORMATION FOR SEQ ID NO:131

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 522 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
    (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...522

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:131

```
ttagcttctt tggcctctgc atactacgga catccatctc gccatctgat ctggtcggtg      60
taaccggtac gaacggcaag accaccgtag ccactctata tatcgactat tccgaaaaat     120
gggatataaa gccggtctgg tgagtacgtt tgcaactatg tggatgaccg gtccgaaccg     180
accactcaca ccacacggat ccattggcat tgaatgctct tttccgtcga atggcagatg     240
caggtgcgaa tatgctttta tggaagttag ctctcatgca gcggcacaaa agagatcggt     300
gctcttgact tcgacggcgg aatctttacg aatcttactc gtgccatctt gactatcacg     360
gctccgtacc ggagtatttg cgagctaaaa aggttttttc gatggcctcg gtgcttcagc     420
tttcgcattg gtcaatgccc agataagaac ggcctcgtaa tggtacaaaa cacccgagca     480
cgtgtatgta ctatgcactg agagcatggc aaactatcga gc                        522
```

(2) INFORMATION FOR SEQ ID NO:132

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 409 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...409

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:132

```
gcctcagcat cggagtgcac ctgctcaatc tcctttgcat ccctgccatg ctttggtgta      60
ttactatcgc cgtgctgtta aacccacagg caggggagtt tgttggcact tttggcttcc     120
ttcgccctta tcggggtgat gatgttcgtg tgatacaggg tatccctaag gttgccggcg     180
tattcgatgt cttcgcgtca acaccttgg tttgagcttc aataacggtt tgtatttcta      240
tttctcctgc tggctgccat attgatttgg tctgtgaggg agacttattc cgtaagaccg     300
acggtgataa gaagggtaca accaaatcga tgcgcatgcg cttgccgcgc tgctgagtgt     360
ggtctgatgg gtattccttt tatcggcaat ggatccttct cgcatagcc               409
```

(2) INFORMATION FOR SEQ ID NO:133

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 776 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:

        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...776

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:133

```
gtcaaggata tgcatggcaa gtatcctttc cccgaggcca cggcaacgag gaagtactgg      60
tcacgggaga gaacgcaggc aaacaaatga agctgctgtg gccagcggac tcgtgggcgg     120
tctgtacgac ttcatcgtgg gcaccttggc tggtggacgg agaacgtttc cacccggctg     180
gccgaatggg gagccgactg gccgagaagt acaagctggt ctttaaggtc aataccggag     240
cggcctcctc ggcctgggct atatcatcgg tctgccttat gccacgatca tctggccggt     300
tcgtttctcg tctggttcgt tatcatgccc cttatcggct actcgccccc ggtatgactc     360
aggccatcgg cgacggtgtg tcgctgacta tcgcctgatg agccctgagg atattttcgc     420
cgtctatgcg cgtcctctcg gatcggaggt atcgccatgg cgggtatcat cgggatcctg     480
cgctcgtccg aattatcggc cgggccgtca agctggccgg taccgaattg accggcaagg     540
gacgagtacc atcgatgagc ctcgcacaca gcgtgatctc tcgatgaatt cattacgctg     600
ggcgtcatcg tcgctttggt ggtgacgatg cttttctcca gttcaacgtg ctattcaact     660
ggggacatac gctgatatcc ctgctgtcgt attcattatt accttccttt ttaccactgt     720
ggctgccaat gccatgccat cgtgggcagc aaccccgttt cggggatgac cctgat       776
```


(2) INFORMATION FOR SEQ ID NO:134

        (i) SEQUENCE CHARACTERISTICS:
            (A) LENGTH: 2691 base pairs
            (B) TYPE: nucleic acid
            (C) STRANDEDNESS: double
            (D) TOPOLOGY: circular

        (ii) MOLECULE TYPE: DNA (genomic)

        (iii) HYPOTHETICAL: NO

        (iv) ANTI-SENSE: UNKNOWN

        (vi) ORIGINAL SOURCE:
            (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

        (ix) FEATURE:
            (A) NAME/KEY: misc_feature
            (B) LOCATION 1...2691

        (xi) SEQUENCE DESCRIPTION: SEQ ID NO:134

```
atggtattct tccgctgtac aaccgttgga ggggcttcct atcaatagcg atccggatcg      60
gagatcgcgc ggccacgatt ggcatgctga gcgtagcgaa attgatcatt gctgcatccc     120
aaataccatt gtcgcgttta gaatatcacc agctttccac ttgtcttgaa tgtcgaaaga     180
ggtacgccaa ctgccgcacg caccgtatgc cccaagacca gggcatcaat tcaccccatt     240
cgcatcggag aagaacggag gacgtcccgt tgccgcaagt gcgcgcccca tggcccatac     300
cgttgctgcg caacgatgga tataggcggt gaacagcagt agtgtatttg ataaaatcca     360
cacccactc ggagaatgtg gcggcatcta tccctctttc tcaaaactac cactcaagcc     420
atgaacgtta agaggagatg cttggaggaa aggccgagcc gcataccgcg acgatgcagt     480
tcatcggcca atgtttgatc ccattgggga aacgtaaagg atccgcctta attctcccgc     540
gctatcacgt acggacgttt gccagtggct ttctatgatg atatggttta tccggctgca     600
accagtcctt tactttgcat cgcatcggcc acatccaaat agtctgctcg tttatttctt     660
tctccttcag ccaacgtgta ctccaaccat aacgggagcc aatccattat accgactcac     720
ttccacctgc caaatcaact gtcggcaccc gattcgttgg ctgctgatat ttcaaattcg     780
aatagatgcg agaagaagcc ttaccgcgaa taattccttc gtgggaatcg aattaaatcc     840
ttcgggcaaa tgcttgatag cccaatgcgt ggggcgtgat ccagataagg tatcttgaag     900
gtccattcac gatccatggg ccaaatagat ctccgggcaa aagaatacgc ggactaccct     960
ctgtcggact cagtgcatag gagcaggaaa tgcgagaagg agaatcagaa gaaagcctgt    1020
cggtcttcca acagagagaa agcgcacctt ttcatcagca gtgtactatg gccaatcccc    1080
ctgagaggtt tccttatata gactcggcaa atccttgccc gtctgaccat cacttccacg    1140
acctgatcga acgaaatgcg gtgtctgcca tcgctgaatt ggcataagta ttggcatcca    1200
aagctcgtgc tgccgcaaag gcattcgttc gatacaaggt acctgcacca atccgcatac    1260
agggtcgcag gtcatccgag gtgatgctcc aaagccatct ctgcagcata ttcgatttgg    1320
```

```
gacgggtacc cccgaatagc tggctgctgg ctgccgctcc catggcacaa gcactcccac    1380
ttcgccctga cagccgactt ctgcacccga aatagaagca tggtgcgtac cacattagca    1440
aaaaggccgg ccgtagccag tgcacgcaat tgcgcttatc gctgaagtca cgagtctgtt    1500
ggaggtggtg gagtaccgcg gtacaacgcc gcacgaccca catgtcggcg ccgttacgat    1560
cttgccaccg atgcattctg ttcgctcaca gccaaagcat aggcatatac attgcctggc    1620
ttcgtacacc cggcgaatac ccctgcgcac gaatcagata gctggcgcct tccggcgaac    1680
gcccagtcca cccggcagca ccccctcagc atcgacccct cctgaatggc gctccgcatt    1740
accgaccaga cctcagccaa atagcccata tatcgggatc ttcgtttttct tccacatact   1800
cccaatagct tagccgcgcc tgttcagttc gtcgagaata tctgccatct tgctgagcgg    1860
attacctcgc gacctcgctg ttcgttgaag tgttcgttgg ccaagactcc gcgccgatgc    1920
tatagatgag ccagtcgtcg agctgcttgc cctctttgtc aagctctcga agagcatgcc    1980
gttggggtga aaattttgga agatctccgt ttccaaacga tttcggtcgg agcctttgct    2040
tccaagacgg caaggatact gcatccgtga ggtgtccttt gcccgtggca gcaaggctgc    2100
cgtataggta acacggaaag aggtcgcccg ggggttccga tcgagaaaca tctcagagcc    2160
cgacgtgggc caatcgtgtg gctactgctc ggaccgtagc cgatggatat atttggggtta   2220
tcgattccat tgtatttgta ttgtactatg cttcaggtgt tgaaagagtg atagtttttg    2280
aaagagccaa cgaagaccgg acagcgatcc gtgtgtagtg gctcagtaat tgagtctgta    2340
ggaaaatccg atcgtgcgaa gacgttatac atccggtaag gaatagcctt gaagtgtgta    2400
ccgtcagagg gatcaggccg aatgtgacat cggcaaacgc acctatctgt gcgcgaaata    2460
atagtcggct cctattatga caccgaaatc cgctcccttta tcttgtccga gaagttcagt    2520
tcgcgcagat ccatctgcgc tgttcccact tgggatcgtc atagaccatc gtaccgtcga    2580
tgatcacgcg gaaggaatct ccagcagcag ggacgtatag agacctccgc gcagcttcag    2640
cctgtcttga gcatattgta ttccgcctgt acgggtatcg tcaggtagcc c             2691
```

(2) INFORMATION FOR SEQ ID NO:135

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 638 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
         (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
         (A) NAME/KEY: misc_feature
         (B) LOCATION 1...638

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:135

```
cagcaacacc caaactggca ccggagctga tgccgagaac ggacggaccg ccaaaggatt    60
gcgaaagacg gtctgcatct gcaagccact aacggataac ctgcgccggc aaaagcagcc   120
gtgagggctt cgggcaggcg ggatttcata ggatattgta gtgcacgagt gcttctcctc   180
cttcgggacg atctgaaaaa gatgtcggaa gatctcgctc atcggaatag ccaccgagcc   240
gaggagagat taaccccgaa gagaatgagt acagccctc ccagcgcagc caggtacctg    300
cgacagaaat tgtacgtaag tggctgacgg atgtcattgg agcaataata gaaatgcggt   360
tggtggtcgg gaagtagtcc ggggtgcaag atgcgataag atcggccagc acccaatcgg   420
gatgcatggg catgagttcg tgaaggctgt ttccctcagg ttgcagtata tcacgccttt   480
ttccttgaat ccctgaaatc ggcatatcgg ctgtcttcgg ctttcaaagc ttcgtaacca   540
actccccggg atagctgttg aggattcgcc agtagcgagc cgaatcggtc ggctgtagac   600
cgtctcgaag tcgagggaaa caccaccgga tcgttgac                           638
```

(2) INFORMATION FOR SEQ ID NO:136

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 3399 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

(ii) MOLECULE TYPE: DNA (genomic)

(iii) HYPOTHETICAL: NO

(iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
    (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...3399

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:136

```
ttttcccaca cgcccttgtt cggcgtaatg gctgtcacca gatcagattc cctttttttac    60
tttctcttcg tcgatacagc ttagcggcac tttgnccggt atcgtccgta tggttctaat   120
tgttcgacag gcaagtcgat tgactctcta tctgttcgat tctttgcagt tcgatgtcac   180
gtgcaatctg aatgtcgatt tcattctatt ttattttttga agtttgggaa tcctttttttt   240
gtgattttttt attcgctgtg tatataacaa aaaaagaagt aatcggttgt acggcgatga   300
aaaagcttat ctttcgaacg attttttcaga aagattcaaa tcaaaaaatg cactgttatg   360
gctgctaaag ggaaaaaaaa gaatttcgtg ttgacactaa tgtaatgctg cacgactatg   420
aatgcataga gaaatttgaa gaaacgacat ctatatccct atcgtttcgc tcgaagaatt   480
ggataagttc aaaaaggaag cgaacaaatc aacttcaacg cacgagcttt tgtccgccgc   540
tggatgagat atccgatcaa gatctgttcg cgaaaggagc ttctctggag aaggcttagg   600
gcgaatcttc gtcaagatca atggccaata ccacaccaag taaaagaagc gttcggcgaa   660
aacaaggccg accatcgtat cctctcatcg ctatgacgct ggctgatgag cagcctaaca   720
tcaagactat cctcgcacca aagacgtgaa cctgcggatg aaagcccgct ccctcggaat   780
gctctagagg attacatcaa tgacaaggtg actcgagtag accttttcga gaagccgagc   840
cggaatacga aggtgttgac ggcgatctga tcgatcgtat tttgcatcca aagacggcat   900
cgatatagac gagtgggaat tgggttcgaa gtcgatccta acgactgctt tgtgatgaag   960
agcgaacgca acagtgtatt gcacgttaca atcctttcac cgggaagata gttagggttg  1020
agaaaggacc tatttcggga tccaaccacg caatgcagag cagaccttcg ccatgcactc  1080
cttacagatc cgaatgtaaa gctcattgga ctgacgggga aagccggacg ggcaaaacat  1140
tgctggctct ggcagcagct ctcagtcagg aacagtctac aaacaaatcc tgcttgcacg  1200
gcccatcgtc tcattggcca ataagacttg ggattcctgc cgggcgatga gaaagccaaa  1260
gtggcaccat acatcaaccg cttttcgaca atctgaatgt gatcaaagga cagttggctc  1320
aaatagcagc gaactccgca ggctggacga aatgcagaaa accgaaaagc tcttatcgaa  1380
gctttggcat acatcagagg acgtagcgtg tcggaaacga ttttatcgtc gatgaagcac  1440
aaaacctgac tcctcacgaa atcaaaacga tatcacccgt gcaggagaag gtagcaagct  1500
gatttttaca ggcgacatca acagatcgac tctccatacc tcgatgccca gagcaacgga  1560
ttggcctaat gatcgaaagg atgaaggggc aaccgctctt cgcccatgtc aatctgacaa  1620
gggcgaacga agcgagctga gcgaattggc cagtgatttg ctctgatctc cggttccgtt  1680
tttcaaggaa aacaaagagg ccgacacaaa cgtcacgtac cttatccgga ttccggttga  1740
cgaagtcttt ccaattcttg actgcgatcc gcccgaacga gccataggtc ccgacgtctg  1800
aaagaagtgg cagcggcagc cgccagtccg tccgtggcat ccatttcagg taacatctgt  1860
tctcaggtat tcgtaaatag cgttggagca tgccggctac ctgctctttg ccgcattgcc  1920
attacctgta atcgcttgct tgatgcgcat cggagcatat ccgtaatagg aatgtcgcga  1980
gccaaagccg ctgccatagc gacaccctgg cccgccctaa cttgagcata ctctgtacat  2040
tcttcccaaa gaaaggtgtt cgatagccat ttcatccggt aggaattcat cgatcagacc  2100
tgtaatctgt cgaatatgcg tttcagacgg atatagtgat tgtcgaattt ctccagcgta  2160
ttacccccat agccatgagt cggggagtat tccccacgac gtgaacatcc cgtagcccat  2220
cagtattgtg ccggggtcta ctcccatgat aatggttcct tcggactcat tctttgctta  2280
caattctatt cttctcatcg tgggaaaaag cagatcagac accgagatcg tggaggattg  2340
cttacaattc tatcttctca tcgtggtggc aaaacccatg accctgttgc cgaacttccc  2400
gtgagggtcg ctatatgttt tgcccccaga ccgcaccaat attcatctat tcagtcgatt  2460
ggtctgcgaa gaaatggaga gccagcgata cgccttcttc tgtgctccct tttcgatgcg  2520
gtgtaggaca ggggaatgca tagatccgca gcaatgaccg atgggatgaa agtcgaacga  2580
agatagtcga tcaatgttcc tctacggcag cctccgttac ccacgttata ttgtacaaaa  2640
tcattcgtgt attcctttca gagataacgc aaagttatga aaaccgcaa tgagcctttt  2700
cccttcaaat atgtggaacg ttagaagcta taatgcaatc aaaaaagaaa ttgagataat  2760
ttgacttttg atttgaaaaa aagaagtaat ttgaggcagt gcagcaaata tagtggtatg  2820
cggtatctac cgtaattgtt tatcataaaa aatcatggta tgaaacattt caattttatc  2880
tcgttgtttt cgctctggct ttattctttt gtgtgaaaat acccttgcac aacaaaaaac  2940
gaggagtttg cacctgtgtc ggatttacgt gcagaagcgt acggctctac gtttttcctcc  3000
actggactcc gccgtatgac aatccgatga ttcctctagc gagagttttg aatcaggtat  3060
tccagctata tggaagacca ttgacgcgat ggcgatggct ataattggat gcatttgacc  3120
```

```
aatttcacgg gacagatggt ctctgtgtct cttcggcttc atacataggc ggcgtcggag   3180
ctttgctccg gacaattatc tgataacacc cgaattaaaa ctacccacag acgcttggtg   3240
gaaataatct attgggtatg tactcaagat ctcactgctc catggagcac tatgccgttt   3300
attcctcttc tacaggcaat aatgctgctg acttgttaat ctcttatatg aagagacttt   3360
gactgccaaa cggatacaat ccccgagttg atccgcgga                          3399
```

(2) INFORMATION FOR SEQ ID NO:137

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 4696 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...4696

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:137

```
aacctattct tctatcagcg gaagaaatcc ttcttcactc atcagccgga caccgagctt    60
ctcagctttc tctctctaac ttcgggcccc aatatccgtc ccggcaagaa tgaaagaagt   120
tcttggacga aacccgatcc gggccatcgt ccgccattgt cctctaccat agcttttgta   180
ctcatcacga ctacgctttc aaatgtacca ctgataacaa ccgttttttcc ggctaaacga   240
ttggaaccgc cacggaaact gtctcagctt ccaacgatac accggccaaa cgaatcgttc   300
gatcaactcc ctgttctgcc gaaggctgaa aaaatgaagt acacagcagc tattctttcc   360
ccgatctcgt ctatctgtac taattcctcg ctgtcgcagc agccagggca tcgatagaag   420
gatagaccgc agcaagtttc tggctacggt ttctccgaca aagcgaatac ctaatccgaa   480
caaaatggcc gatacggacg ggctttggag gcttcgatac tgtccaaaag tttggcagcg   540
cccgtttttt gaagccgggc agagtgagta gctgctcttc cgtaagggat aaaagtcagc   600
aacgttacga atcatattgc ggctataaag caattcgtcg tctccgggcc gatattgatg   660
tctgccgtct tgcgtccgca atagtgtcga gccgtccttt ctgctgctgt gggcagccct   720
cggcattcgg gcaatatagg cagcttctcc ctgttcgcgt accaatggtg tagcacagtc   780
tggaagagca ctgtaaaaac tataggtctg ccatcgatac tgcgtgcatc cgttccacac   840
ccactatctt gggaatgatc tctccaccct tttccacata gaaaagtctc cctcgtgaag   900
gtctttctcc gcaataaaat cagcattatg cagctggcgc gtctcacgac cgtaccggat   960
atcagtactg ggtcgagatt gccacaggtg tgaccgcccc cgtacgccct acttgatagc  1020
ttacatgctc agacgagtac gtactcgctc ggcctgatac ttataggcaa tagcccaagt  1080
gggctttttgg ccgtaaagcc aagcaaatcc tgctgagccg gagcattacc ttgaggacaa  1140
taccatcagt agctacgggc aatgtcagac gctcggatcg aaacgatcga taaaggcata  1200
tacctcctcc ttactacagc atagttgacg gcatcagaga ctttgaaacc ccactgacgc  1260
gcctgcatca gtcgtcgtaa tgattctctg ccaaaggttc atcgctatat agatagtaga  1320
aatagcatcc aagtttcgtc cggctacgat atgggggtcg agctgcttaa tgtaccggaa  1380
gcggcattgc gcggattggc aaatagaggc tccccttcgg ctcccgttgg gcattgatcc  1440
gatcgaattc cttgaaaggg agcaatatct tcctcgaact tccaacatac ggggataatc  1500
atcgcctctt agtcgcaaag gacagatcgg atggtacgga cattagccgt tacatcatct  1560
cccattatcc atcgcctctg gtaacggcac gcaccagcat accatcttcg tagataacga  1620
aatggaaagt ccgtcgaatt tcagctctgc aacgatttcg aaaggtcgcc ttgaagtcct  1680
tcggacacgc gacgataaaa atctccaatc tcatctaatt atatgtattg ctgagggaaa  1740
gcatcggtct gtcgtggcga acggagcgaa tccttccgtt ttgtcgcttc cgacacgatg  1800
cgtaggcgag tcagactatc ccattcgggg tattcccgtt ccagctcctc aagctgcttc  1860
atatggcgtc atactcgaag tcatcgatag tcggagatga gagaacgtaa tcctgtattc  1920
gtgctcacgc agaatgcggc gcagctcttc tattcggaca caggggggaac tatctttttcc  1980
ataactgata aagcaaaaca tcagaataac gccggcatgc cacatccatt ggcggagggt  2040
ggctgtatgc tcgaagccgc agcttcgaac agcatccggc tcggcttgtt atcttccagc  2100
acataaggat gatctgatgc aagcgtaaat agtctaaaac ataatgggat atcttgggag  2160
agactcgacg gctattccca gccgacggta ttcgggaata acgaaaaccc tacggctaca  2220
cgtcgatgaa aggcatcgta ctcatacaga tctacgcacc gacaggctta tcgtcatccg  2280
```

```
acaagcagat gacaagacgc atctgcccaa ctccatcaaa ccctcagaac tcttttcgat    2340
atattctttc agcgattgcg tccgataggt accagcatat tgccactctc acgcaattcg    2400
gatcattttc ccataggtag agaaagtcca aatcttccgg ttcaagggct ggagccgtac    2460
ttgctctgaa gagaaaaggt cggtcatgga atatcagaat tgactgagtc ggagaaatcg    2520
gtacgattga gaatagaacg accgagggaa tctcatcggc atattcgatc tcatcgccta    2580
tagcaatgcc tcgagcatta cactgacccg aacgccggta ggctccaact tgcgaaagag    2640
gaaaaattgg tagtatcgcc ctccatcgtc gtactcaaag ccaatataac ctcataatct    2700
gctcagaagc tactcgatgc accaaagaat ctatttgcaa atcgccgggc cgatcccatc    2760
catggagat atgactccac cgagtacatg ataaagcctc gatactgtga ggtattctcg     2820
atagccataa cgtcacggat atctctacta cgcagagtgt actctgatcc cgagtggggt    2880
ctgcacagat atacaaacat cggaatcact gatattatga cagtgcctgc aataggaaat    2940
tgttcccgaa gatctacaag ggctgctgca aattgacggg tattttccaa ggttggcgca    3000
ataagtacaa agccaggcgc agggctgtct tgcgccctca cccggcaatg tggcaaattg    3060
gtctatcgcc ttctcaagca gacgcgagaa tatttctgta tcattcatcc aaaatatcca    3120
gctcgttgcc gtcgtatcgt aaaatgtgta gtccaggaat cccagactct catcggggat    3180
aagttgatcc ccttggcata cttgagtttc catttcttca agatagaaga aaggaacctt    3240
tcttgaggta tgctgccacg tatggatgta cgtgaagaac gaatgtttga cttggtgctc    3300
cgtgaccatt ttggccactt tttcttccaa ctatccgtga agagtatgga ggattctacc    3360
ttgccggtac ccaaacatgt ggacaacact cttcggtatg gatgaccatc gccggacgaa    3420
cacgctgacg gtaatctgca taacgccgaa tttgctcaat ggcaagatat tgtgtcgcgt    3480
ctgtcagccg acatcaattt gaccatgtgt tcgtacaact gctgacgggc tgggcttcgc    3540
tcatatcgat gaagtccact acgatgatac cacccattcg cgcaagcgca attgtctggc    3600
.cagttcttcg gctgcagcca tattgaatcg acggccgttg cttcctgctc ggtactgcca    3660
cgcgagcggt taccgtatta acatccacca cgtgcatggc ctcggtctgc tcaataatca    3720
gatagcacca ctcttatacg taacagtacg tccgaagaga gctttaatct gctcgtaatg    3780
gcaaaatggt cgaaaatggg tagttcgccc tgataatact gacgatttcc tcccgtcccg    3840
gagctatcaa ctcgacatag tcgctcaaac ttcccgaaaa gccttgtcat tgacaataat    3900
actctggtaa gagggattga gttgtccctc aagagtccca gagtacggct ggcttcctca    3960
taaacaatga cggagccttg gcacgcaaaa gcttcttgat gttgtcgtcc caacgacgag    4020
taggctctgc aactctttgt ccaattcgga tgcccgttta ccttcagaga agtgcgtatg    4080
ataacgctaa aattcttggg cttgatgctg ataatcactg ccgcaagcgt gctcgctctt    4140
cggcagaacg aatcttctga gacacgacac tttgtctgca aagggtacca aaaccaatga    4200
acggccggca aaagaagctc ggcagtcagg cgtgggcctt tggtagagat cggctctttg    4260
gcttctgcac caagatctgc tgtccggcct tgagcacatc tgcgatcttc cctctttagg    4320
gaggtcgctg ccgaggggca ctttggacaa ggatggaatc gtttgctttt tgtcatcatc    4380
tccatcatct tctgctgagc atcgaaagtc agcccaaatc aagataatga agaaatgcgt    4440
ccttcttgta tcctacatca cgaaagcagc gttcagaccg ggcatcacct tcttcacttt    4500
accgaggtaa tatcccccac tgcaaaagaa agattgcgcg gttcgcgttg aagctcccga    4560
gtttgccatc ctccaggacg gccatagata cctctttggg cttaactcaa ttactaattc    4620
gctgttcact tatatggtag gattgtcttg atgatataaa tacaagtaag caaatacggc    4680
ctgtgggcgg ggatcc                                                     4696
```

```
tccccgcgga agatttggca gcctatttgg gtgtaaagca tgtaatccct gcgccaatgg      60
tacagacgca ttgcaaatca gtctgatggc tttgggatga aagtcggaga tgagatcatt     120
```

```
gtgcccgatt tcacttatgc agcaagtccg aagctatagg tttgttagga ttaacacctg    180
ttttcgctga tgtagaccta ttacatttaa tcttacatct aagggctgcg aaaaagttct    240
gtccgcaaga cgaaagcaat cataccagta cacctctttg ggcagtcctg cgattggagc    300
cgcttttggc ctttgccaag cgaaacgatt tgtttgttat cgagacaatg ctcaggcaat    360
gggaggggga tatactatct ccgatggatc taccgaaaaa caggaacaat ggggcatata    420
ggctgtgctt ccttctttcc acgaagaatt tgggttgtta tggagacggt ggtgctgtca    480
caacaaatga gacgaattgg caaagcgagt gcgaatgata gcgaaccatg gccaaaagac    540
aaatacaaac atgacattat cggatgcaat tcccgactcg atactattaa gcggccatcc    600
tcagagtaaa attgcaatat ttggaccgct tcaatgcctt cggaatgagg tcgcctcaca    660
ctatacctct ctgctcgaag gtattgatgg ctacaaacac cgacctcctt gcagcagtct    720
tcgcatgttt atcataatat actcttaagc tcttggatca gaacactcgc gatggactgc    780
gagacatctg acgaatcata agatcgcttc gatgtatac taccccgatac cacccacagg    840
caaccggcat tcgtcggtat tgctcattgg ggtgaatctt tgatgtgtcc cgactctttg    900
tcgcgaactg ttctctccat ccccatctat cggaaatgga gatagagcaa atccatgctg    960
tggtatcagc aatcaaaaca tcgaaccgtc tttacaatga caaaagagga gggaggctcg   1020
tctatgaaga aggacgaagt tccatgatgg caaacagcat gaaactgatc agcgccggac   1080
ct                                                                  1082
```

(2) INFORMATION FOR SEQ ID NO:139

      (i) SEQUENCE CHARACTERISTICS:
          (A) LENGTH: 1057 base pairs
          (B) TYPE: nucleic acid
          (C) STRANDEDNESS: double
          (D) TOPOLOGY: circular

     (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

     (iv) ANTI-SENSE: UNKNOWN

     (vi) ORIGINAL SOURCE:
          (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

     (ix) FEATURE:
          (A) NAME/KEY: misc_feature
          (B) LOCATION 1...1057

     (xi) SEQUENCE DESCRIPTION: SEQ ID NO:139

```
tcaaccggct atcggtaagt aggaatcaga ttcagcatcc gataaagagc gagcgtaact     60
cccagaggaa agtcgataat cttgtaaccg atggaaagag gatgcccaca caaagggcga    120
tcagggcctg tccgcggaag tagctgtcat attcttgtcc acttctttga gtatgctcct    180
aacgcgaata cggtgtcgac cgggaaaaga ttgacaaatc ctttgcccag ttttttcgaaa   240
tcgaaaggat gaaaatgaag tataaaacac ctatgaagaa gatcgtcgta tagcgaacaa    300
gctgatcgta ccggagacga gcttattgag ctgtccgaat atcccttgct attctccatc    360
natttctcgt aagagatacc tttgaacaga tcttcatgct gccactctct gacagaaact    420
tgcggatcgg agccggcagc actgtagcaa attctcatcg atgcggtact gctggagcag    480
ggttattgtt tgcttacctc ttcttctaca gcaggaacca aagagagaat ggcaaaaaaa    540
tcaatgccga tatgaaaacc agcaccgtga tcaccgacag aaagcgaagc gaaatggag    600
ccgatactgg acaaaacgaa ccagaggcat cagcacaagg caagaatcca agagagacaa    660
aaaggtataa ggatgcctct caagccatga ctatggccat aatgcctcca accaacagga    720
tgatgaaaaa caggctgcag tacggtcgaa cgtaaattcc ctgtcaaaaa aactttgcat    780
aagcgtgtcg attagaatgt gagtgagttc ggataccgaa gatagtcgtt tttctgtttt    840
cttttgcaat tttcacaatc atccatgtag atcgtttttt acgaggcttg tcctccctgc    900
atgttcgggc cggtaggcga gtgtcagctg actgctttct cgaaaatacg aacgggaaat    960
gctcggattg cggtctgaga tcctgaaaaa caggcgcgag aatttttcg ttgtggcgcg   1020
agaattttg cttcccgaac caaaacgaaa attttct                            1057
```

(2) INFORMATION FOR SEQ ID NO:140

      (i) SEQUENCE CHARACTERISTICS:
          (A) LENGTH: 648 base pairs
          (B) TYPE: nucleic acid
          (C) STRANDEDNESS: double

```
        (D)  TOPOLOGY: circular

   (ii)  MOLECULE TYPE: DNA (genomic)

  (iii)  HYPOTHETICAL: NO

   (iv)  ANTI-SENSE: UNKNOWN

   (vi)  ORIGINAL SOURCE:
         (A)  ORGANISM: PORYPHYROMONAS GINGIVALIS

   (ix)  FEATURE:
         (A)  NAME/KEY: misc_feature
         (B)  LOCATION 1...648

   (xi)  SEQUENCE DESCRIPTION: SEQ ID NO:140
```

```
cggcaaacat cgctccggtt acgaatatgc ccagatcctg agtggagaca gggacatcat      60
tccatccgcc atcgcaatgg taatgaatgg atccggtaga cggctgcgtc gatctgtccg     120
ctgcgaagca tttccaagcg caaagggttt tattgacttc ggtcttggtt atctcgcttt     180
cgtccagtcc tgcggtttga taattcggtc ggtggtgtac tcaatgaccg tattgcgcga     240
tataccagat tctttccttt gagggtttcc aagctctcac ctgtataatc tttgacatta     300
ccagccggaa gtatccgtcg agacgcatca ccagttgcag atcatacctc ctgcttgctg     360
catggctgct cccgtataat cgatgaccgt acctccacat tgcccgaatg gaaagccgca     420
tcacgttcat tgggcgaata gacttgacaa tctccagttt cagtctgagt gaatcgtaaa     480
tgccggtttt tgtgctacaa cgaaaggcag atagtccatg gaaggcatgg ctccgagagg     540
agggtataag gctctttttg tttgtctgca gagcttttct tgttaccaat gaagagaggg     600
tgatgctcaa aaccgccaga acaaggaggg taaaaaagaa aaattttt                  648
```

```
(2)  INFORMATION FOR SEQ ID NO:141

     (i)  SEQUENCE CHARACTERISTICS:
          (A)  LENGTH: 2149 base pairs
          (B)  TYPE: nucleic acid
          (C)  STRANDEDNESS: double
          (D)  TOPOLOGY: circular

    (ii)  MOLECULE TYPE: DNA (genomic)

   (iii)  HYPOTHETICAL: NO

    (iv)  ANTI-SENSE: UNKNOWN

    (vi)  ORIGINAL SOURCE:
          (A)  ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix)  FEATURE:
          (A)  NAME/KEY: misc_feature
          (B)  LOCATION 1...2149

    (xi)  SEQUENCE DESCRIPTION: SEQ ID NO:141
```

```
cgccggtgaa agctgtgata agcgaagcag ccaagccgaa tggagcgata tcttgatgtt      60
tttgagagca aagtccttgt gtttgtcatc ctttcgcaca ggtagatgcc acatacgccc     120
aaagcaaata cggatccgag agtccagagg aagagatcgt gtgccagaac ttattgatcg     180
cagtggaaga gaatacaaag cccagaaatc cgtcatttcg tttgcgcatc gtatcggggt     240
tgaagtcatt cctaccggct cctgcatcca tgcattggcg ataagaatcc atacgctgac     300
aagctggctc cgatgatggt cagccatgtg gcacttaggt gaaacctttg ctcaccttgt     360
tccagccaaa gaacataacg gcaataaaag tacctccatg aagaaagcca aaataccttc     420
gatggccaat ggcgctccga aatatcgccc acaaagagac tgtaattaga ccagttggta     480
ccgaactcga ttcgagaatg gattcctgtg ccacaccga tcgcaaagtt gataccgaaa      540
gcttctgcca gaactgagca taacgcttcc actccggttt gccattgcat aatagatggt     600
ctccacgata gccatgatga cacccaatcc cagtgtcgcg gaacaaacag ccagtgatac     660
atggctgtaa gagcaaactg tgcacggacc agcttactaa ggcatctaaa ttcataatca     720
tacgcttata tcttatgttt taggggttta ttccacgttt gataagttcc tgctgcacat     780
attcgatttg gcagtgctgt cgctaccgac ctgttgcttc agaaagttcg ggagaagaat     840
actttcagga tggcgaacat gatgaatagt ttgatgagga tatagcccat agcgtctttc     900·
```

```
ccaatttcat attcctgaag ccatctatat aaagcgagct atacgcatga acaagttctc    960
gcgctttgct ttgattgttg catagttttt tcgattcaaa aatgaaaaac cgtgcaggtc   1020
tcgatttttt gctgtggtga ttcagctttc ttacaaatat aggatgggaa ttgttttttgg  1080
gacgcgtttc ctctctaaaa tatcacattc ggctcaatgg agtcgttttt tgtttgtttt   1140
tgaaagatca tcaagtacca aatcaatacc agcaattccc tcgcgagagg tcatgaaaag   1200
ctccacatgc gcaccggatc gaatcgattc catgtgatat atgacctgtg ataggggtttg  1260
ccatccactt ttacgactcg ataccggt tcttctcact tagattgtga gccgtcagtc     1320
gaagatacga ccattgggct gagggatagt cacatgttcg aacaggggtg atccagttcg   1380
taatggccgc ttattggatc caccggatag aaccccaggg cgagaatacg taccaagccg   1440
aaagttggcc gcagtcttcg tttccgcata gccgtcaggg gtatttttgt atagttctgt   1500
caggatgcgg cgtattatcc cgctcctttc catggctgcg ataccttgtt gtacaagtaa   1560
gccacgtgtg gctcggctca ttgccgtggg catattgtcc gatcattccc gtactgaaat   1620
cggcaatgct atatgagagg gagtaggagt gccgaaaaag aggccagacg gcgagccatc   1680
gaatctgcac cgcccatcag ttccatgaga ccttcgtatc atgctggact ccgaagagat   1740
attgccatgc attactctct gtgagtcctc agtgtattcg aaaggatcga aaggaagttt   1800
ccattccccc gatctaattt gggtctgaag aaaccgcttg ccggatcata tacctcttgg   1860
tagccttggc gtggtgcgca tatgccatcg accgcttggc tgccgctgcg tttcccttgc   1920
aaagagtgcg atgcaggcat tgtcgtaggc gtattccatc tcttgctcaa gctccagttc   1980
gtacagtcgg ccggcacata gcccaaatgc gataattgtc cgtatcggtt ctgccggttt   2040
tttccatggt cgaaaccaca ggcgcatgat gcgctgcgga ttctctttgt aattgccttt   2100
ccgatagctt ctacgatgac cggtatggaa tggtagccga tcatcatac              2149
```

(2) INFORMATION FOR SEQ ID NO:142

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 508 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...508

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:142

```
cgccgcttgg atctcttcat ggtcagctct ctggacaagg gcggattggt tcgggtggta    60
ttttctctat tgctttcgat atggtagccg tggtggaata ccctccagat ccctgctcag   120
cgtctcttct cccttgatgg ccgacgcatg aaacggaacg atctggtcaa agccgacgaa   180
ctcttcaagc gcgtctgctg catcagcttc tttccggtgg ccttatcttc ttgcttattt   240
gggtcaatat cgacagcatc ttctccatcc tcccgaacgg tcacctctat gccgcggcaa   300
atatgtcgtt ttctatttgg gaatcgctaa gatgatcgaa atccgctgaa ctacggcaat   360
ccgatcgtga gctgttccaa gtattatcac tgaatcttta ctatactttt cctcgtcacc   420
cattctggcc cgtgctcacc atctggtggc tgatcctggt tttgggaatc aacggaccgg   480
ccatggcacg tcttgaccac gctgcttg                                      508
```

(2) INFORMATION FOR SEQ ID NO:143

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 506 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

(iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
    (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...506

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:143

```
cgctttctcc cgtccgcgtg ccaatggtgt gatcgctatc gacctgcgaa caacgatggc    60
ttggtaagtg tccgattgac caatggtaaa tgcgacatgt tattgccaat tgcggtggac   120
gtgccattcg tttccatgaa tccgtggtcg tccttcgggt cgtacagcca tgggagtaaa   180
gggaatgacg ctcgacatga tggtcaggac gaagtantag gaatgatctc tatcaaagca   240
tccgnagaag agaccattct ggtagtaagt gaaaagggat acggcaagcg ttctatatcg   300
accgactatc gtattaccaa tcgcggtggt aaaggggtga agaactgaat atcaccgaga   360
agaccggaaa gctggtcgat attcgagccg ttccgatgcc aacgacctta tgatcatcaa   420
taagagcggt gtcgccatcc ggtaaaagtg gctgatctga gcattatcgg tcgagctaca   480
caaggtgtta gctcattgat ttgtcc                                       506
```

(2) INFORMATION FOR SEQ ID NO:144

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 1022 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

  (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...1022

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:144

```
ctcaccaatt tttatttcac ctatattata gtggtcgtcg atgttaccca agcaaaaatc    60
gtatataagc cgtctttctc caaagggatc agccattctt tgcagctgac aactggacat   120
cctcaaacac attggcactg cgaaggaacc atccttatcg aaagcataaa cgttcaatcg   180
ggcaacttcc gcaggaaaga aggattttcg gcacactcag tctgagaata gaagttgaca   240
tataccctcg aggacaatca tcgtaattgt cataaatcat cttatcgcac gaagcaagcc   300
accccacagg gccattattg ccggcaaaga aataataagt ctggaatatc catatgcttc   360
cgtttgttca ttgtttttaaa aaatatagag ggggagaac ggtgggaacc gaaatcccac   420
cctcaaaaag aaaattttac atagctaatt agagatcaac ctcataggaa tgaactttcc   480
aaggcaaaac gtaacctcaa ccgacatgaa cgtatcctga tcaggtaagg ggttctccga   540
tctgtaggaa caggagtacc cggctcatcc ggattcgggt cagggttatc ggattttccg   600
gattgttagg atccggatcc ggcaccaaag gattccattg aagcccaact tcttgatgct   660
cttgatgtgg atatggtaga tattgtgcgc acaacgggag aattccacca tgaatcggga   720
gaagtagtac tgggatcaac caagcatagt acagtacttt gcctttcaca tatttgtgtg   780
ccttatacca gctacaccac ctaccttggg gtctgtaacg gatttcatag acaatagaac   840
tggccattct caccaacgaa gaaatcttca cctgctacat atcaggaact gcagtattat   900
ctgaataagt ttacctctat cgataaaggc tctttcttgg gagtaaactt cgcacgaacc   960
aatacatagg cagtattacc ctcttatagt ctgacgaagc agcattagca cctgacttat  1020
gg                                                                 1022
```

(2) INFORMATION FOR SEQ ID NO:145

```
    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 986 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

   (ii) MOLECULE TYPE: DNA (genomic)

  (iii) HYPOTHETICAL: NO

   (iv) ANTI-SENSE: UNKNOWN

   (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

   (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...986

   (xi) SEQUENCE DESCRIPTION: SEQ ID NO:145
```

```
cggttttttct ttttttgcaga aatgcaatgt caccaagttt aaagggtcag tcgctgcaca        60
tcatatacag ctatattaat tccatggcca gtgccggata aaaatcattc agctcttgtt       120
ttaaaatctc ggcataggcc aaattttatt attagttgtg tgccttagca actttgattt       180
actccctttt tggaagggtc tatctgtccg aaagagagtc cgttataata attctatctt       240
tttctttaaa tcatcgagaa gaatggtatt aatattatct tcaagctcca aatatcccca       300
aaagatattt gggattgctt cttaataaca ctatccaata atgaataatt gtttgctttt       360
tttgctcggt gaagtttttct atgatgaaag gatggtgaat aattcttgat gtttaacaac       420
atctctctca atacccatg agaagttgtc ataaaagcat aatattgagc aaatgatgaa        480
tttaaaaatg gcaagttagt ttcaaaatat tttcatcaga tttttcggaa ataatacctc       540
gattcccta aaataagaac aatcgtaatc caaaaaagaa gccgtgagtt attttttctgg       600
actccctcat tcaataatag gtgaggagcc ctatatgatc aacatatcct aatcttctga       660
aaaggaatt tgttattcta gtaccaagtt aataggtgta taaaaacgtt tgattgtttt        720
tgatgtgtga tgaggattaa tttgatattt tcatctgttt ttttgcaagg aacacttgtt       780
tctatccaac accatagaca actttatctt taaaactcct ttgtaaagaa ggaaggtgtt       840
ggataggcgt tttattagat tataatctgc aatattgccc caatggctat tttccatatt       900
ttactgtttg gaatttggca ctccgttcgt ggagaaattt gatatctgta gaatcaacta       960
atacccatc aattaagttg atttaa                                             986
```

```
(2) INFORMATION FOR SEQ ID NO:146

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 497 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

   (ii) MOLECULE TYPE: DNA (genomic)

  (iii) HYPOTHETICAL: NO

   (iv) ANTI-SENSE: UNKNOWN

   (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

   (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...497

   (xi) SEQUENCE DESCRIPTION: SEQ ID NO:146
```

```
ggtttcggcc gacatcggac gggggaaagt ggatttcagc ttgtttctca ggaatccggt        60
agtacggatg ttgtatctca gatattcgat acagaaaaat gtcctcttat ttcttccaac       120
tcaaggaatt cggcgaaaag atgggaggga agtacccgca ggaggatggt tcgaacagct       180
acttcggatc cccggatcat tcagatagat gaagataaag aagaagaaat tccagaagat       240
gaatggctgt cgtaattgaa acttgtcgga gagcccttga tcagctaatc ggatccgcga       300
```

```
gcaggagggt gctatgctgg agcaggtgtt cacggagaaa atactaatat ctcttctttg    360
cttctgcaaa tcgaacagta tgaacccgat agatccaacg aatcaaagag cggatagaag    420
agaacctaac caaaatatca ggaaagactt ccaccagaac ngattcgaac caagagatga    480
tttattatat gaaaggt                                                    497
```

(2) INFORMATION FOR SEQ ID NO:147

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 3605 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...3605

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:147

```
ttccctcacg gtactggttc actacgggtc tctcgggagt atttagccta cgggatgggc     60
cccgccaatt cacacaggat gtctcgtgtc ccgcgctatc aggtgctccg tcgtctattg    120
ttcgatatgt cggatacgca gctttcagct cttcggccat actttccagt aggttctcct    180
atatctatca ttaaactttg tcgaagtcct attaccccga ctttgccgaa acaaagccgg    240
tttggctaat ccccgttcgc tcgccactac tgagggaatc acttttgttt tctttcctac    300
gggtaatgag atgtttcagt tccccgcgtt cgctcatgaa atcattcatg tgtcaggcct    360
tggcctgacg ggttgcccca ttcggatatc tgggatcaat tcgtatgtgc cgattcccgc    420
agcttttcgc agcttatcac gccttcttcg cctccgagag cctaggcatc caccgtctgc    480
ccttacttac tttgttcgcc cggcaatcaa ttgccgccgg cggtatactt aagcttgttt    540
gctctactta aattctttat ttgattttct tccaatatgt caatgatccc tgttttcttt    600
cgtggagaat atcggattcg aaccgatgac cccctgctgc aaagcaggtg ctctagccag    660
ctgagctaat cccccgtagt cccaggagag ttgaactgcc gacctctaca ttatcagtgt    720
agcgctctaa ccaacgagct ataggactgc ttctctctta ttcgaactct tccgtctgcc    780
tgtgcagctc cttgggctgc atgaccgttg cccccttatct ctctttattt tttcttttttg    840
ccctttttgc ctcgcttcaa aaaaagaagc aaagttcgaa gcgggaaagc tcgaaagata    900
aacgaaccaa ggcctcgggg gagggaaaga cccttatctt cctgtatctc tccatcttcg    960
attcaagaga gagagaacac ctcccggaca tcccgcttga ttgcatcgga atatccgcag   1020
gttatattct tttattcata cgtcgaacaa atatggcttt tcgccgtgca gtaaagtttt   1080
cggataaaaa aaaagccgag agccgaaacc gaaggcgata tatggtcttt cttcttcccc   1140
cgatcggata aatctccgac accggttccg ttgcaaaaac cctaccttca accaattctc   1200
cttaatttttt cgggcaaccg tttattcaat cggtccgaac tccagaaagg aggtgttcca   1260
gccgcacctt ccggacggct accttgttac gacttagccc cagtcaccgg tattaccccta   1320
gtggcccctt gcggttacgc ccttcaggta cccccgactc ccatggcttg acggcggtgt   1380
gtacaaggcc cgggaacgta ttcaccgcgc catggctgat ggcgattact agcgaatcca   1440
gcttcacgga gtcgagttgc agactccgat cgaactgggg aagggtttag agattcgcat   1500
ccggtcgccc ggtagctgcc tttgtccctc ccattgtaac acgtgtgtcg ccccggatgt   1560
aagggccggc tgatttgacg tcatccacac cttcctcacg ccttacgacg gcagtctggt   1620
agagtcctca gcgaaaactg ttagtaacta ccgatgtggg ktgcgccgtt atggcactta   1680
agccgacacc tcacggcacg agctgacgac aaccagcagc acctacatag aagccccgaa   1740
gggaagacgg ttttcaccat ccgtatctac atttcaatcc cgggtaaggt tcctcgcgta   1800
tcatcgaatt aaacacatgt tcctccgctt gtgcgggccc ccgtcaattc ctttgagttt   1860
cacgttgccg gcgtactccc caggtggatt acttaacgct ttcgctgtgg agcttgacgg   1920
tatatcgcaa actcctagta atcatcgttt actgcgtgga taccagggta tctaatcctg   1980
tttgataccc acgccttcgt gcttcagtgc agtcgcagta tggcaagctg ccttcgcaat   2040
cggagttcct cgtgatatta tgcatttcac cgctacacca cgaattccgc ctgccgccac   2100
tgaactcagc ccggcagttt caacggcagg ctgaacgttg agcgctcagg tttcacgctg   2160
acttaccgaa caacctacgc acccctttaaa cccaataaat ccggaaacgc tcgcatcctc   2220
cgtattaccg cggctgctgg cacggagtta gccgtgctta ttcttacggt acattcaatg   2280
caatactcgt atcgcccgtt attccgtata aaagaagttt acaatcctta ggactgtctt   2340
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```
ccttcacgcg actggctggt tcaggctctc gcccattgac caatattcct cactgctgcc    2400
tccgtaggag tctggtccgt gtctcagtac cagtgtgggg gataaacctc cagttccct    2460
acccatcgtc gccttggtga gccgttacct caccaacaac taatgggacg catgcctatc    2520
ttacagctat aaatatttcc ttgtaataca tgcaataata caagtgtatg cggtttttagt   2580
ccgtctttca acgggtttcc ccctctgtaa ggcaagttgc atacgcgtta cgcacccgtg    2640
cgccggcgcc atcaacctta gcaagctaag atcatgctgc ccctcgactt gcatggttaa    2700
gcctatcgct agcgttcatc ctgagccagg atcaaactct ccacgtcata tttgtgtttg    2760
tttgcttctg tttttctcgc tcagacgccg attttaccct ttggataatt cgatttatca    2820
ggtagtacac ctcggtttct tttctctctc ggtctttcg tttttctctt tgacagagta     2880
tatgtcctcg tgagagacgg tttcgtcaat aacagccggt aaatcggccc tcctctctgc     2940
agagggcaga aatcctgcaa gaaatggcga agcccttctc tctccttctg tactacactt    3000
ttgttcttcg tatgaacaat gtcaatgatc gctgtctttt atccctatc ctcccacctc      3060
acggcacaga gccgatcaag cagcggaagt gggtgcaaaa gtaaaacctt tttccgaatc     3120
ggcaaaatca atcggccttt tttcagggct gacgctcaag aaaaagctcg tcgcctgatc    3180
ctcccctaaa aaaagaatcc cgacgcgctc ggcggaacaa ttcctctatc aatcggcagc    3240
aatcgctttt gcggtcacaa aagtacgcct tttttcttta cagcaaatct ttcaaaatct     3300
tttttcaacc ggttcgacna aaaaaaacag ccccgaagaa aaggactccc tcccaagaaa    3360
gaagacaaaa gggagcggat aataatatgt tcgcgcgcgt aagaacaatt aaaaagaccg    3420
caaacgaaaa aaatgagaag atgtttttc cctcgcacaa aaaagatttt ttgaccgaat     3480
gttggcggtt ggtccggaat aaagggtaca agggaaagag aagggtgtga aaaaaacaga    3540
ggcaccaatc gcacaagccg aaactcgaac cgaaaatgcc caatctcaa accaaaatcc     3600
caaaa                                                                3605
```

(2) INFORMATION FOR SEQ ID NO:148

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 646 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic).

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...646

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:148

```
tggttcggac gacctttttg gttttcctca cttattccgt cgtacagctt cgttctcgct     60
gatgcaggac ggtcgggtag agatgggaga cgggctgaca ttctctattt cggtgtgaat    120
ctgatcttcc tcatgttcag ctacctgtcg tctatctgat ggagcgtgct ttcggctacg    180
tttccaatat cagtttgttg agctgagcga cgtcaatacg ccgctgctca gtcagctctt    240
cggaagtggn cgccgggcac ctttcagcat tcgatccaag tgtccatcct cgctcggagg    300
cagccaccaa gatcggagca gatgtacagc ttgtacgcac cgggctctct atcatgatat    360
aggaaaaatg aagaacccat cttatttcac aggaatcagg gagcagagaa tccgcactcc    420
aaattgcctt ttgacgagag tctcgcatta tcattcgtca tgtgaccgat ggtattgcct    480
tggcgcagaa caccgtttgc cggactccgt tatcgatttt atccggacgc atcacggacg    540
ggtaagacca aatacttcta taattcctat tgcaatcagt atcccgacaa gaagtggatc    600
ccgagttgtc acttatcccg ggcccgaatc cattcaacaa ggagac                  646
```

(2) INFORMATION FOR SEQ ID NO:149

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 239 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

(ii) MOLECULE TYPE: DNA (genomic)

(iii) HYPOTHETICAL: NO

(iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
    (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...239

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:149

```
acgctgtcgt ttttatttca attgcaccat acaggaatta aaaccgcctt atgctcgacg      60
acgcagacga atcggatcat ttcaattgca ccatacagaa ttaaaacgct ttggctgcga     120
attcccttac gggccaatcg aagatttaat tgcaccatac aggaattaaa atgtatccat     180
tatactactc ccaaaactga caactagttt cggggttatt tggcttgttt tttaggtat      239
```

(2) INFORMATION FOR SEQ ID NO:150

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 697 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...697

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:150

```
ctgacatccg ctcgaaccat ggacacctcg tctatgataa tcagatcgaa cttcggatca      60
gtttcttgtg ttcgttcgtg tagcgaaaca catcgaaccc cgtctgtcac gagtactcaa     120
atcgggatcg ttcggcggaa tcgggcgaga ggcagtttga aaaacgagtg gagcgtctgc     180
cctccgacat tcagtgcgca aggnccggta ggcgcaagca cgacaaactt cttatgcgtc     240
gtagccagat atgccgaagc agtgtggact tacccgttcc ggccttgccg gtcagaagag     300
gctttggtct gtgcgttcga tcaggctgag cacatagccc atccctcatt ggcaaggtcg     360
attgcggaca ggccctcctc tctctttttt gtttgcgacg aggcatgcgc tcaggggcgt     420
ttgtatcggg ctttgacttt cgcttggccg gtttgctctc gttgtggaag cgatctacgg     480
ccgtcaccca taagtataat cggctgaagc atgggaagtc gggaaggcga atgctgtttc     540
gggagtaatc acccaaatgt tttcagcttt gntggatcgt ttcttcatcc atgacggaag     600
gcatagacca cgaagtagga agctttgaca gggtcggatc atcctttcag cagccnaatc     660
aggtgaaaac tgatggcaac caagcggatg cagcctt                              697
```

(2) INFORMATION FOR SEQ ID NO:151

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 3108 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

(iii) HYPOTHETICAL: NO

(iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
     (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
     (A) NAME/KEY: misc_feature
     (B) LOCATION 1...3108

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:151

```
aggtaaggga tttaggccca acgcttagta actttgcagt aaacgataat cggtatttca    60
aggctttgaa aacatacatt tcgagagaat aacatatctt cttcggaacg aatttatttg   120
cgtcagtgca aatagcaagg tatgtctgcg ttacccgaaa ttatttcggt aactcaaaac   180
ccttgctcct gcagaggcag aacacctccg aagtcggtgt tcttggatag aagttttcgt   240
tgtctgattg gctatttat cgtgaacgct ctctaatgga tttcaattat gtttgcacgt    300
tctatttcca gaagagagaa ttacaaacca ttaaaatcca aagaatgaca aagagaaatg   360
tggggcgacc tcccaagaat gaacgagccg acattgttgt atggttcgat ttacggacac   420
agaatttgct cgtttcctaa cctattcgag caatcggggc ttcaaaatag agccgctttc   480
atcaaggcaa ggtctttaat gagacctttc gagtgataaa agtggatcgt tcgttgctca   540
ttactaccaa aaactgacaa ctttgtacgg acaatttcgc agtgtcgggt gaattataac   600
caaactgtag tcgctttgaa aagcaatttt acggagagaa agcctttgcg atgctcacta   660
agttggagaa actgacactc gaattgctat tattggaggg gaaatcgtac aactcactcg   720
taaatttcaa gagaatggca acatcggcaa tagacatatt atatcatatt gctccttgca   780
tggagtaaaa atcagacttc ccttttattt gaggaagcct gattaaccaa tgcattatcg   840
cttttttgaac ttgccgcctt tcagatcgct ttccaccata cgttattaag tttctcacgg  900
agttcatcaa gaaaataggt gcggctatca ttttgcgacg tttcatgttc atatagacgt   960
tgtagctgtt ctttatcgcc ctccgaagat cttccgagag agcgtctgcc agttcctcta  1020
cacctatttt ccgttgttga tactgttgca agtgtcgaga gcataaagga gttcaactat  1080
ctgttgcttt gcctgtccaa cagagtttct tagcaggtct gactggcatg caggaagaag  1140
tccctgcatt cgcattttca gtaattcaag ctccgttcaa tgacaaagag cagttctgat  1200
acatttttc ccctctccgt ccattaatct cccctttgca aaggttgcag gcaaaagcgt   1260
gtataacgga gggtcgaaac aatgagacta aatctctttc tgcatcacat agggcaataa  1320
tctcagaata aagttgtctg acgctttttg tatctgtcct tttgtagagc ataagagatt  1380
attgtcttaa agtcttcagt ttgagtaagt cttagcataa tatatctttt atgttcaaca  1440
ttgtagattc tctgttgtga gatgtgattt tgacgaattt ccctatgaat ttgaatggca  1500
aagaacagtg tcatcaaagt gcaaagacgt cggctaccgg ttgtgcataa agcactccgt  1560
tcaatcccaa tatgatggga gcagcaatat tacaggaata aagaagagtc cctgtcgcca  1620
atattgagca aaaggctctg tcttgctctt ccgattgcca tatatatgtg gaatacacaa  1680
actggaagcc gaaagtgaaa aacattagcg tattgctcta agggcaattc gtgcaatttc  1740
ttgcattgtt tcgtctttgc cgaacaactg ataacaggag aagcaaaaac gagtatgaaa  1800
gtgctccaaa gtaacaaaat gaggttgtca gtatcaagga acaacgtact gcctctttta  1860
actttggaaa ttttctgccc cgtagttata gccagccatc ggttggagtc cttgacaaat  1920
ccgaaaacca cgttcgttcc caatgttaca attttcagaa gatgcctact gctgctacag  1980
cctctgcccc atattttacg gcagctctcg caataaacta atcgaaagtg tttggaggag  2040
ttgcaaacag agcattgaat acctatcttt atgatgtcca agtacattct tatcgttggg  2100
acgaacaggc aaacgaaact ttcacctctg ctttcataaa gaagcaggtg taaatgttgt  2160
tgtaatgatt cttgaaagaa tggttgccca cgcagcacct ttcaccccca gccgaaagca  2220
tagataaata gaggatccaa tgcgacattt ataaagaacc tattatcatt gccgatgcag  2280
acgttttgaa gcccctgag aaatataata ttggacatcg acacattcaa cgttcctatg   2340
acacaactaa cgtgaacagt ctgccatatg cttccgctaa gctcatcatc tcctcgtttg  2400
ccccatgaaa agcagaattt ctggtagaaa cgcattgcat acaagggcaa gagagcagct  2460
aaaatcacag aggtgatcac tgagacggaa gctacctgac agccttgaca atttgcttcg  2520
cacccaataa gcgagatata tacactcccc cccaacacca aacatcagcc ctatcccaag  2580
aaacaccaac gataaaggaa aacaactgat acggcagcga caggaagagt tcccaaacgt  2640
gcaaccagaa agtatctacc acattgtata ttgccataat cagcattgcg atgacatagg  2700
tatccccaac tttgtcaggg atttcatcat acttccttct tgcaaatatt cacagcgttg  2760
ttcatcctta taatctgtat cttcttaagt aaaaaattct gctgcaaagg tacaggggga  2820
tacaggtcgt cacaatagac aacaacggtg ataatagcac tattcgtggt aattctttct  2880
gaaaagcgtt gagaaactcc tgcaaccttg gtaaatagtc gtgtgaagta ggagtaatcg  2940
caaatcccaa accttgtgct atctctttta cagaggttgt tgtatagaca attgtcgctt  3000
agcttgcaag atgatttcat cctgaatatt ccgacttaac tcgttcccca aacagcattt  3060
atcgcttcat tcaggtaggc aactgtttat tcaaacgttc ggcaagaa              3108
```

(2) INFORMATION FOR SEQ ID NO:152

        (i) SEQUENCE CHARACTERISTICS:
             (A) LENGTH: 575 base pairs
             (B) TYPE: nucleic acid
             (C) STRANDEDNESS: double
             (D) TOPOLOGY: circular

       (ii) MOLECULE TYPE: DNA (genomic)

      (iii) HYPOTHETICAL: NO

       (iv) ANTI-SENSE: UNKNOWN

       (vi) ORIGINAL SOURCE:
             (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

       (ix) FEATURE:
             (A) NAME/KEY: misc_feature
             (B) LOCATION 1...575

       (xi) SEQUENCE DESCRIPTION: SEQ ID NO:152

ctcagaaata tccgtctacc atcgtccagt atatcagctc tcaggtagtc cgagtgctca   60
agacatggca aatgcagaag tggagatgca gaaggtacca ccgagatgca acagcaaagc   120
gatgtggaag ctcttgcccg caactatcgg acaagttcgt atctccttct ttcctgactt   180
cggcggaact cgatcgatga acctcggcgt aagcattacc gaatttatca agactgcgac   240
accggcgaag tcaatatccc gatgttggag aataaccact attctttggt aaagtggtgg   300
ctaaaaagtc cggattcgaa tcgctcaatg tggcaatcat tgcctggact ccgccaatct   360
gtctaaggcc gacagccttt gcaacgcctt gatgaggggg gcgacttcgc tgctgcagct   420
cgcacgttca gcgcagatcc tcctctcgtg agacaggcgg tgtactcacg ttccccaacc   480
agtttacaca atgcccggat tagcacttat taccagaagg ctatgggctc agcagcttga   540
nccttcgaca cctctttttt agcggttcca tcgaa   575

(2) INFORMATION FOR SEQ ID NO:153

        (i) SEQUENCE CHARACTERISTICS:
             (A) LENGTH: 522 base pairs
             (B) TYPE: nucleic acid
             (C) STRANDEDNESS: double
             (D) TOPOLOGY: circular

       (ii) MOLECULE TYPE: DNA (genomic)

      (iii) HYPOTHETICAL: NO

       (iv) ANTI-SENSE: UNKNOWN

       (vi) ORIGINAL SOURCE:
             (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

       (ix) FEATURE:
             (A) NAME/KEY: misc_feature
             (B) LOCATION 1...522

       (xi) SEQUENCE DESCRIPTION: SEQ ID NO:153

ggattcgctg ccggctgccg acaaagcctt gctgctcatg ttctattcga tgacttgtcg   60
gttcgggata tagcggaagt gaccggtatg tcggagtcaa cgtgaaggtc aagctccacc   120
gacttcgcac caaactctat aaaatgagag aaaatgaaac agaatataga agacaaaaag   180
ctcaaagagc tgttccacag ttacccaaac agccggctcg gactcaaaca acgcttcgac   240
gtgatcgtgc cgtacgagag gaagctgctc ggcgcgaacg gcgtgcccat cgtcgttcgg   300
catcgccatg gtgggagtat gtgtccttgc ggtggttgtc ttctagtatt agactccaag   360
ggattgttta gcggtctcga tttcgatagc ttgttcaaga ccgatctttc cgcaatccct   420
tcgtcggttt gggcagcgat aagccggagc acctctgatc ttcctgtccg tggtcatcct   480
cttcgggcta tcctctacga actatatcgc aacacgaagc at   522

(2) INFORMATION FOR SEQ ID NO:154

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 674 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...674

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:154

```
tccccgggaa atccctcttt tcagtatgca acactccgga aataatcgcg cgatatagtt      60
gctcttgccc gttccctcac cacccgtaat gcagaacaat tgtcgtaggt tcccaaagga     120
acgtcgttca cggaaataac cgttttgaac gatcgggcgg attgttataa ttgatttcac     180
acgaacttaa aagcatatgg tttgtgtata taattgttcc aaatggtcgg atatcagctt     240
cctgaatctt ctgtgctgtt tcccagcttg aagtaatcgg agatatcttt ctctgtttgt     300
tcccggataa aggcaattcg atccgctgta atttatggtg agaaacgtt cgcaccagcg      360
tgtagaggct tttatgcccg tttcgtccat atgtacaaaa agaaaatatg cctgaacctt     420
cgtgcaagca tttcgatgac gattcttcga tattgcctgt ctcactgttg aaacagatgg     480
catggaatcc tgagaggcaa gggataatac atctttctct cctcccgtga tgaaaagtaa     540
tctcctcttt gcggaagttg ctccatcccg aacacatagg tttccggcat attcccccgt     600
aaacgaaccg gcattgactg aaaggacgat atatcttaca tagtctttgc gcaggaagcc     660
gaagatcggc tctt                                                      674
```

(2) INFORMATION FOR SEQ ID NO:155

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 463 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...463

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:155

```
ggccgtctcg gacagctttc ctgttcctgg caacggactt tgccacgctt gcgccgagta      60
gtccgctccg catacttttc ctttcgtcct tgtcagaagt tggcgatgtt ttgcccgccg     120
ccgcaaccga tgtcgagaat atcctcccac cggacggtcg gatacattcg tcgatgcacc     180
agagagccat tttatttggc cgtagttcat ccccgcaagc atcatttttc cccagaaatt     240
gttttaggtc tgcggcaatt gcttatgaac ttcttgaaca gtctcatctt ctatcagcag     300
ctaaaagaac aagaaataac gaggagtctt ggccttgtat tcgggtattc ctctccgtag     360
gtctcctcac aatagcgttc ttctcccagt ataggaaatg tgtggcaatg atgaagggta     420
tcatgacgag tagcatccac acgaggcgga agcgatacaa acg                       463
```

(2) INFORMATION FOR SEQ ID NO:156

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 451 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...451

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:156

```
ttggggattc acattacccc tgctgcggtc gaagtccgta gcgtgtacag aaccacgagc      60
ggcttccctg taaccgtttt ggcatgtatg ccggccggta ggtgagccag tcgtgggagt     120
ggatcacgtc gcacggtatg gtacgcgtat cacgcctgct acgatggagt aattattgat     180
ctcttccagc agattgccgg atagcgtccg gaaaattcga tacagccgag ggcatccgnc     240
ttctttagct aaaatcggca taaatgttgc tgcgcagatc ctcgtatgtc cggaatccat     300
tcggttgccc aagagttggg tcacccgttt nggtggggac attttgtata ctatgggagt     360
gcaagttggt gcctatgagt cggaggaaac tctgtcctcg tctccccacg gtttgggaat     420
ggacgaaagt aatatccatg tgggctgcat g                                     451
```

(2) INFORMATION FOR SEQ ID NO:157

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 1039 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...1039

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:157

```
gccaacgctc ggaaaacatg ggcgatccca gtaccactac agccaaggcg catctgccag      60
aaaacgggag ccatgctgct tcatcaggct tagcacttca gcttatcacg gtcttccacc     120
agtatatacc gggtctgttg cctgttctgc cggacggagc gcgcagtgcc gctgtcatca     180
gagcctgcac gtcctcggca aaagctgctc ttcggagaat tgtcggatag agcggcgatt     240
ttctataact ctgcaaatga tttcatatag acaaagatac acaaatagcc ctctggctat     300
cttttcatct acacgagaaa tagcagcaag gcagtatgcc ggtttcctcc tgcagtacgc     360
ccgatcaaac ccgatggact ccactcataa aagactcgat cacaaacaag aaaaagtcca     420
tttatgatcc ccaaaaaatg tgcgcgagaa aatttcactt ttggagtcct ttgaaaaaaa     480
ttattgacaa ccctcatttt ttcagaggnn tctatatcgg ttttactcgt cgccgttcgt     540
tgttttcttt ccggccggga aaagtttccc cgacagccga caaaaatatt tttccggccg     600·
```

```
gaaaagctct atccaaagcc ttcggatatg tatccaagcc tttgtacaca tatacgaaag      660
ctttgtttat atatccgaaa cctttgataa agaattggat tatggctttt tcaacttttc      720
cgtactgcag aaaaactttt tccggccggg aacgattatt tntttttatt gctgtgacct      780
gtgtgtggat actacctccc acaaacgagt gttccggtaa agtatccgcc tcccaaaggc      840
atcagtgcag caccgaatcc tttcgcatct gtgcataaac ctccgggcaa acacccttc       900
gagtatgcat acagaggtgc aggaatatgg ttgtcgttgc ggtgggttag atttatcttt      960
gccgcaaaag aaatccttat aatatggngt acaaagtttt tttgtcgctc tgcataggtt     1020
tagccctgat gcaagcgca                                                  1039
```

(2) INFORMATION FOR SEQ ID NO:158

      (i) SEQUENCE CHARACTERISTICS:
          (A) LENGTH: 643 base pairs
          (B) TYPE: nucleic acid
          (C) STRANDEDNESS: double
          (D) TOPOLOGY: circular

     (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

     (iv) ANTI-SENSE: UNKNOWN

     (vi) ORIGINAL SOURCE:
          (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

     (ix) FEATURE:
          (A) NAME/KEY: misc_feature
          (B) LOCATION 1...643

     (xi) SEQUENCE DESCRIPTION: SEQ ID NO:158

```
agccatttca ctgtgtccga tcgcttcgag acagcgtgcg gcttcgcaag atgactgcgt       60
tcatacagct cgtgtggata gtacggggct gagacagtga cagccaaaga aaacgatgct      120
gaagagcagc caaccaaacg ggcgacttcc ccacatatcc aaggtataat cattcaaggg      180
aagggcagtg tcggggtttg cagcagccgg gctttcaggt ttgagcggat gcgtgtcggg      240
gataggaggg ttttttcagg acagaataca aagtcctgtt cgctctttgt cagcaggccg      300
gcaggagacc caaatcgcgc atcatgcttc gtactacggg tggggtacgt agggcttctt      360
ccctatgatc tccggtacca tctcgtgacc gggttgaaga gcaagaggcg cggatgcttt      420
atttccgtcc gaagtcggcc gtatctccat ccagtcgaca gtattccatt tatatatagg      480
ggttggtaat cgatgagtag agagccaatg ctctgcacgc tctatgaggt agaagatcgt      540
gcgtttttat ctgtacgagc ganaagggtt ttgcattttt tctttcgacc cagctgatag      600
ccgtcatgct atccgaatag ggtggggggg ggtttttttt ttt                       643
```

(2) INFORMATION FOR SEQ ID NO:159

      (i) SEQUENCE CHARACTERISTICS:
          (A) LENGTH: 1144 base pairs
          (B) TYPE: nucleic acid
          (C) STRANDEDNESS: double
          (D) TOPOLOGY: circular

     (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

     (iv) ANTI-SENSE: UNKNOWN

     (vi) ORIGINAL SOURCE:
          (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

     (ix) FEATURE:
          (A) NAME/KEY: misc_feature
          (B) LOCATION 1...1144

     (xi) SEQUENCE DESCRIPTION: SEQ ID NO:159

```
gcgaaaccat tcccgacttt catatatgga gttcaggctc ggccaattaa cgatgcctta      60
aagactgatc cggtgggacg cgctgaggaa gttcgttata catcgatgaa atagaaaagc     120
gagcagagga aatgtgcaag gcggaactct gcatcgtgag ggaaaactgc ccaaacgggt     180
atgccactgc gacacgaggt aaacaacatg cttttcgacg aagacggaca tgtactttgc     240
gtcatgacct cgacaccgtg atgccgaact ttattttctc cgactatggc gacttctccg     300
taccggagcc aacaccggcg aagaggacga caaagacctt gacatgtaaa cttcgacatg     360
gaaatcttca aggcctttac cgaaggatac ctaaggggggc aagctctttc ctcaccgacg     420
tcgaaataga gaatctcccg tcgccgcagc actatttccc tatatgcagt gtgtgcgctt     480
cctgacggac acatcaatgg cgatacgtat tataagatca agtaccccga acacaatctg     540
tacgcactcg tgcacaattc aggctgctac agagtgtaga ggactgcagc tgcagatgca     600
agcttttatc gaccaatgtc ttaggtatta agctcttacg tgtaccaatg tcagctacag     660
acacactttt ctaaagacaa gaagacccac cgactttagt ggctcttcgc acaatccttg     720
cggatacgat gaagcggact taaagtcgct taacgttcaa gtttttgata taaaagttaa     780
tcataaagat tatgaactca ctacttgcca tccacaaact ttattaaaga gaacgagaga     840
aatgcaatcg gcatttctct cgtttttgcaa agacgacgta ctctccggtt aggacgacct     900
tccgtccgtt taggtcgacc taatcgctct gaaggacgac ctatttgctc cgcaaggtcg     960
acctaaacgc tcggttaggt gacctgactt cttgtcaggg tcgacgtatg cggtttattc    1020
ccttgtagtt gcggacgaga aggggggtac gaactggaaa acaacccttt ataaatcacc    1080
gttttcaaa ggtctcatgc tgtggagaag agactggtga taagtattcc tctccgatgg    1140
atgg                                                                 1144
```

(2)   INFORMATION FOR SEQ ID NO:160

      (i)   SEQUENCE CHARACTERISTICS:
          (A)   LENGTH: 1377 base pairs
          (B)   TYPE: nucleic acid
          (C)   STRANDEDNESS: double
          (D)   TOPOLOGY: circular

     (ii)   MOLECULE TYPE: DNA (genomic)

   (iii)   HYPOTHETICAL: NO

    (iv)   ANTI-SENSE: UNKNOWN

    (vi)   ORIGINAL SOURCE:
          (A)   ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix)   FEATURE:
          (A)   NAME/KEY: misc_feature
          (B)   LOCATION 1...1377

    (xi)   SEQUENCE DESCRIPTION: SEQ ID NO:160

```
cttctttgca gctctcaact ctgccgtatt tagcgacggc tcctttgtga tatccccaaa      60
ggcgtcagat gtccgatgga gctttctact tatttccgat caatgcagcc aatacaggac     120
agttcgaacg aacgctgatc gttgccgtga ggattcttat gtgagctatc ttgaaggctg     180
tacggctccc cagcggatga aaatcaactt catgctgcaa tcgtggagat cattgccgag     240
accaagcgga agtcaagtat tctacggtac agaattggta tcccggagac aaagggggtaa     300
aggcggtatc tacaacttcg tgaccaagcg aggtgtctgc aaagcgacaa ttcaaaaata     360
tcttggacgc aggtcgagac aggttctgcc atacatggaa atatcccagc tgtgtcctgc     420
gtggcgacaa ttcgatagcg ggttttactc cgttgctgtt accaataatt tccagcaggc     480
agatacgggt cgaagatgat ccatctcggc aaaaataccc gtagccgtat cgtatcgaag     540
gtatatcggc cggttcaagt cagaacagct accgaggatt ggtcaagact ccaagaatgc     600
ggtcaatgct cgtaaccatt cgcaatgcga cagtctatgc ttagcgatca ctgcggtgct     660
catacatacc cttatgcgga tgtccaaacg atacggctat catcgagcat gaagctacga     720
catccaagat cagtgagagc agatattcta ctgcaactaa agaggaatcg gtacggaaga     780
ggcctagggc tgatcgtcaa cggttatgcc aaagaagtga tgaataaact gctatggaat     840
ttgccgtaga ggcacagaaa ctacttagta tctctctcga gatcggtgg gataaagatc     900
tctgcaatca tttcaaaata aaaaacactc agtatgctta agataaagaa cctccacgcc     960
acagtacagg gcaaagagat ttgaaaggaa tcaatctgga gatcaatgcc ggagagattc    1020
atgctatcag gggccgaacg gatcggggaa aagtacgctc tcttccgttt tggtgggaat    1080
ccctcctttg aagtcacgga aggagaggtg acattcaatg gaatcgactg ctcgaactcg    1140
aaccggaaga acgtgcacac ctcggactct ttctcatttc caatatccgg tcgagatccc    1200
gggcgtcagc atggtgaatt tcatgggca gctgtcaatg aacataggaa agcgatcgga    1260
gcagaacccg tatcgcaagc gacttcctca agatgatgcg agagaagcgt gccattgtgg    1320
```

agcggacaac aaattggccc agccgttctt gtgaacgaag gcttctccgg tgagaaa   1377

(2) INFORMATION FOR SEQ ID NO:161

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 989 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...989

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:161

```
gttcgaggta gcagaggtag tgtcccggca cgcagtgcat caggaagaag taaggccgaa    60
gatcagcacc atcagttttc cactcatagg caccaccaaa gcatatagcc tacaagtatg   120
ccgaatatgg agctgtattt gagcaactta ccttgtgcga gaatccggtg atggccgttg   180
cgattcctat gagaatagta caaggggaag aatagccaac gggaaacgat aagccagtat   240
gctcatgccg taacattcag tccgatggtt atccatgtcg tgtctataaa tcggctatct   300
gtgtacgtgc atgtgcttct ttctgtctct tcctattaca aatatggtca ggccccctcc   360
tactatcggg atcagcatcc acagataatt ggtcgataac cgatatgggg gtaaacgaaa   420
aggatcagca gactcgtggc aaagtgacgt atcccatat caggctgggg atgcctgctc   480
cgcggatcag cgtttacgtg tctgttcgag catcttctcg atcatctgta cgctctcttg   540
ggtgtaagct gtttttcttc cattttttg ctatccgtta gtggttcgat tccatttgaa   600
aatgtctccg caaggcattt cttaccgctt ccgatgcaat ataaattagt ttacagtata   660
aaccaaatat aaatgaaaga attttcgag agagggagaa gattaaggaa ggcgagagaa   720
tattttacgc cggcgatata aaattggaag acgatggaat aaggcttcat cggtgcaggg   780
gataaagccg aggagaagat tctcggaacg ggaagcggag aagtccggtc gcaacgacgg   840
aagtcgcgac gtgcacgaac aacagcctgc atatggcgga attgccggtg agcaagaaaa   900
ccatggcgga gaggaaatcc agtagagcgc gatgcgcatg gtgggcttga gggctgtttc   960
cggcaaattc ttgtacagca cagcagatt                                      989
```

(2) INFORMATION FOR SEQ ID NO:162

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 1093 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...1093

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:162

```
aacagggagc caagcgtttg cgggccctct tcttctctga ccacgaggaa tgccacgggc      60
tggtaattat gtgccgaagg agctatgcgt ccggcttcag gatggccatc aacttctctt     120
cctccacagg acgatcgata aacttgctac agatctgcgc gtgcggaaga aatcttctat     180
caaacgaaaa tcttgagaat ctgtttcatt atatctcttt ctctatttta tagttgtttc     240
tgtccaagcc tgacggctga tcatctcacc gacaaatccg gttaggaaca gttggtgccg     300
ataatcatcg ccgtcagcgc gatgaagaaa taaggccgat ccgcaccaaa ggtgcctgcg     360
tatgcatgat tatagcggac aacttattga caggacaacg gccaaagcta tgaagccgat     420
taggaacatg cctgaaccga gagcccgaag aagtgcatcg gcttcgtcc gaacttgctg      480
ataaaccaaa cgtaagcaaa tcgagatagc cattgaaaaa acggctgata ccgaacttgt     540
cgagccgtat ttacgcgcct gatgctgtac taccttctcc ccgatgcgcc gaaaccggcg     600
gatttggcca aatatggaat gtaacggtgc atatcgtgta caactcgata ttctccacta     660
cctcgtgtcg gtatgctttc aaaccaaatt aaaatcgtgt agcttgatgc cggacagctt     720
tcgggctgta gcattaaaag ctttgagggc agattcttgc tgaacagagg atcgtaccgc     780
ttaccttcca accgcttacc aagtcatatc cccttctgt caccatccgg tacgctccgg       840
gatctcatcc ggactatcct gcaaatccgc atccatcgtt atactacctg ccctgtgtg       900
cgggcaaaac cacattggag accggccgac tgccgtagtt gcggcggaat ttgatccctt      960
tgacctcggg atgctctgct gcaaacgttc gatcacactt caggagccgt cggtacttcc    1020
atcatctaca agatgacctc ataggaatag ccatgctcat tcattacacg cctgatccag    1080
caaaaagttc ggg                                                       1093
```

(2) INFORMATION FOR SEQ ID NO:163

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 515 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...515

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:163

```
ggctacgatc ggtagcgtgg gcaactctga ccatgctctg gaaaaatcgg aaaggccggt      60
cgttctcgct ggttgggtcg cagacctcac aaccgagggt ggtgatgaac cctgtggatc     120
accccatggg tggtggtgaa ggtcgccgtc aggaggtcat ccccgttcac gcaagggctt     180
gtatgctaag ggcttgagac aagagctccg aagaagcatt cttctaagta catcattgag     240
agaagaaaaa gtaatctgat ttaatcaaag aaaattatga gtcgttcact taagaaggtc     300
catatattaa tctcaagctg gaaagaagg tcttggcgat gaagagagcg gcaagaaagc       360
tgtcattaag acgtgggctc gtgcctcaat gattctcccg acttcgtggg acataccatt     420
gcagtgcata acggaaataa atttattcct ggttttggta cccgaaaaca tggtggggca     480
taagttaggg aagttctttt ctacacgtac ttttc                               515
```

(2) INFORMATION FOR SEQ ID NO:164

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 1426 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
    (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...1426

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:164

```
gggccaaagg ttgcgaattt gccgtactcg tctctctgct ggagccggaa acgagttgta   60
caacggcggt attgtggata tgtcctacag atacgataga tgtatgtgat tcgtccgcag   120
tttttcattc cgatgataac cctcctgtgc agacgtccaa aaagggtctg gagtacagac   180
agcagcttgc catcgccaga aacaatccat cgatgtttcg aatttcgaga gtcagctcga   240
agatttcggg aaagattcgg taaaaactat cgccttgcca gcgaacgatt caaacggcta   300
tcgacgagat agacaagtcc atacagcact tgaataaaat caagaagcct tggtcggcag   360
cgagtacaac ctccgccttg cgaacgacaa ggtgaagccc tcaccatcaa gaaactgaca   420
cgaggcaatc ccacgatgaa acaaagttcg aagaagcccg cctcgccgaa gaatgacgca   480
ctccgggata aatgccaacc gtacatctcc atgtgtatta taacaatttt gcgcaaagca   540
tctgaggtgt actaataaaa tgtcagtcaa agaatagata ttgacagagc gaaacggatg   600
ccggcgaagc gacagagaaa aaagtaatgc cggatggaag ctgccttcgt atcgaagata   660
cggcggtgct gtcagagaaa cagatcgacg ggtaaactac cctctccaga tagagggcat   720
gagccggagc cgaaggccgg cacggctgcg atcctgcgat tcgatgatgt cccgaaagtc   780
tgtgtggata gcttgcccgt ccccacatgg aagagcgtgc cgactatggc acgaccatat   840
tgcgcaggaa tctgtccgcc gtgatggaaa agacccattg acggtctgtg caagtggcat   900
ccatcgggct tccgttatac ggcagttgtt cttttgacgt cggtatgcag tttgctgaag   960
ctcgtgaagt cgatatatcg ggaagaagag ccgccgcttc attcatgcgt ccgaagtcga   1020
gcttacgatg gtcttcagca tcaagccttc cataaaagga tctttctgct cggtcagaag   1080
tagtggtaag ttcgggagat ggcatcgaag cgcgcgtggg catcggcttg acaggagcca   1140
ttcggtatat gacgatgtcg cgtgggagga gtttatgagc ctttctgtca gggtggcagc   1200
ttccgccggc gtatcgcagg gaagacggca tgtgctacca tctcgtgggc atgaactcct   1260
gcatcggttc gtccgctccg acgaccccga caggttggcg cacgatggta gatatggctt   1320
ccttacggtc tgctgcacac cgggggcatt aggctgcgtt tgccagccgc tgagcgagtg   1380
ccgttgtatg ccagatagat gaagaagcgc gccatttatt attctt             1426
```

(2) INFORMATION FOR SEQ ID NO:165

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 641 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...641

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:165

```
cggcgatttc ctaaatatac gataaattat agagtttttc tacatagttt catttaatag   60
ccagtgccta aaattctggt aagttttttt tgtgttggaa gcacttttgt attaaaaatt   120
aaagcaattt ctccatcagg acaaaaccaa tggatttatg tagaaatggt aaaaccatct   180
ctttgccaaa attatattga cacaatagtc cattatcgat tttgacaatt tcttagtccc   240
aaaagtgggt tcccaataac caaattcacc ttttcaaaat catcaggatt cactccccaa   300
tagtatcccg acaccacaga tttttttctt ttttttcttt aatgaaatat cgttaggatt   360
atctatcaaa taagggaatt tattggtttt gttatccaga gtttcttggg gttaagatgc   420
tcaactaatg ccaaatatag gtgaaagctg ttactttaat agctaatgga tctatttcga   480
ttccaaagat tttttaccaa agtatatcat taagttcttt gaaggttatg accttctctg   540
```

```
attttatttt tccatntcct aataagtctt ttataacttt cgactaagaa attccagaac      600
cacaagccgg atctaaaatt taccatggga atttggtcat t                          641
```

(2) INFORMATION FOR SEQ ID NO:166

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 1386 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...1386

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:166

```
cgcttttact cgcatcatga aatataaatt ctttatattt gcgttgtttg aaaatgctaa        60
ggtacgatat tttgattgtt attttaatgg gatcgtacaa gggtaatcta aatagcaaaa       120
tgatttgtca agataagagc aactaaagac taataatata gggcaagaaa taatgcccgc       180
ggataagtct gacagaggaa atcagtagct aaggtcatta ttcctctcgc cataggcggt       240
ctgctcttct gggtgggtgt accgcaaaat ggatttctcc gccattggca agatgtccgc       300
gacggtgtca attactacat catagctttc tctctcttgt tcgattggcc gccaactgta       360
tacgcggcct gcgctggcaa ctcctcatag aactttggct tctcctcatc cacggaaaat       420
caatgccatt ctgactactt tggcaattac acggtcaata tggctctgcc ccgtgccgga       480
gaattttggc atgcgcggaa gaaagccgct acgagaaaat acctttcccc caactnctcg       540
tacgcttttt atggacagga tcatggactt ggtgatggtc ggacttatac attgagtatc       600
atgatgggct ttcaagggtt tttctccgct tttttcgtcg caatccacaa ctgacacaag       660
gcttttcac cattttcagt tccatcggct atacgttgtt gttgtaggta tcgggctact       720
tttcttcttg ctctaaaata cctctcacac gtaggcccca ttcgcaaagt agcagcactc       780
atcgtaggat actggagggg cttcggtcta tctggcatat ggagcacaag tggtcttcat       840
cttatattcc atcctcttgt gggtaggata tttcttttac tttacaccac attctttgct       900
ttcgacttta cacgatcgtt ggggatggga gggggttgat cagcttcgcc atgagcagca       960
tagccgtagc cgtacccgta aggggggcgt agggccgtgg cacttcatgg ttattgctac      1020
tcttgtggct tcggcgtgac gaaagaagat gccggagcgt ttgccttggt ggtacacaga      1080
ctcaaaccgt ttggactacg gccgccgggt tcgtggctat cggcttgttc cttttgtcaa      1140
taagaaatac gatcgcataa aacagtcaaa caattacaac aatcatccaa aacacttttc      1200
acagttatgt caacagagat caaaacctca aaccacaagc tgtctgggag tacttctacg      1260
acctgacaca aatacccgac ctaccggaca gatggacgag gtgaccaagt acgtattcga      1320
cttggtaaga ggcttgggtt tggagaccga gcaggacgag gtgggcaatg tctcattcgc      1380
aaagcc                                                                 1386
```

(2) INFORMATION FOR SEQ ID NO:167

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 305 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:

(A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...305

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:167

```
ttgcttcaat gcttcatatt gagacatctc ttgattatag ctcattttga cacaatgttg    60
tatttgtcat ctgcatcaac acttgacatc accatagggc gtgagacgta atgataaact   120
ggagcctggg gaatgcctta cgaagtcctt gagaattgat gcttgcaggc gagggtgtag   180
atgaaggtct atttcacgat gagtactgtc ccctcggact tgagagctga atcagattga   240
tataagtctg attgagcaag gcgcatctga aagccaaatc tacgactatg ctgacactcg   300
gcgtt                                                              305
```

(2) INFORMATION FOR SEQ ID NO:168

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 654 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...654

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:168

```
cagactgatc agtaccaatc cccaaaaaga atgccggaag aagaaataaa acattgaaag    60
gatttggcac tacccaattt gcctcgaaaa tcgagtctta ccacatacga tcgtaaaaat   120
ccgattggag cattctgatt ttctcctttc ttccgattgg caaaactcct cctccgatag   180
atagatcttt cccaacccca tcgttctgct tgccgattga gcgtatcgtt catgatcgga   240
tgcaagcttt catcttctga tacaaatccg ccacatgccg gtacaaaccg aatacctcgg   300
aaatagcttc acaagcgaaa aactcaggac atacaatact gctcgcatat aagagcataa   360
acgattgtag actccagacc taagggaata tcacaggcag cgagagatgt aaagaggaga   420
agatgattct aaagaccacg agaaggcaat gccgggcaaa ataatggcaa ggaagtcata   480
aagagaaaat tttccataaa gtatcatccg tatttaatca aagaataaga tagaagtaag   540
attccccct tcttttagtg tcgtagtctt attcaggaag cgcaaattag tcatattcgt   600
ccgctttca atggaataac ccgccatctt tttccgtttc caagcattac cgag          654
```

(2) INFORMATION FOR SEQ ID NO:169

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 4512 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
      (A) NAME/KEY: misc_feature
      (B) LOCATION 1...4512

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:169

```
ttcgaaaggt ctgaccctaa tgaatgcaaa gaacgccgtt gggtatgtgt gtgaagctga    60
ctcgtgcagc tcgtggtgca gccgtgaaga aacagtaaaa aaacgtacaa gaagcaagcc   120
ggagcttcga tcgaagttcc ggctttccat aacgaaggag agccgcccct gatacccctg   180
aagtgggggca acggagcggc tcttccatat tcgagagtcc tatttttagtc gtagcgtatg   240
aaatactgat cgtcggcctt ggcaatatcg gcggagagta caacggcact cgcctaatgt   300
gggtttccgg atggtgaatg ctctggccga agacggtgga gtgagttcgt ggaagctcgt   360
tacggagcga tagcgcgtat gcgtgtgaag aagcggagct gatcctgctg aaaccaaata   420
catatatgaa tctgagtggc atgccgttcg ctactggatg caacaggaga atatccctcg   480
cgaacaggtg ttgtccttgt ggacgatttg gctttgcctt tcggcacttt gcggctgaac   540
ccaagggaag cgatgcgggg cataacgggc tgaagaacat tgccgaggga tgggatcgat   600
cgattatgcc cgtctgcgtt tcggcttggg cgacgagttt ccaaaggaag gcaggtggac   660
ttcgtcctcg gccgttttac ccccgagaag aggagaagct gccggagctg accaagcatg   720
ccgtggagat catcagagtt tttgcctggc cggtatccaa aggacgatga accggtacaa   780
ctaaggagat ggaagaggta aggatagacc gttggatgtg ggctacgcgt atctcaagac   840
acgaacgata gccacggatg cctgcaagaa aagccgagta acgtgaacgg gctgcaagcc   900
aagccttcgc gtatgggtacg tgtgggcgac gcattcaggt aaggaagcca ccggtgacct   960
attcctttcg tattctggct tggctcagaa tcggatgggt gccaagctgg tgaaggactt  1020
tctggaaaaa tcactccgcc cgaagagtat gagatactcg aaatgcaacg catttcggct  1080
ttgtggacag agccaagggc accggtcgtc cgaccaaaaa ggacagggag agctggagca  1140
gtttagcgaa gagatgcccg atctgccgta ctcgttgatt cgttcgactg ggatgaagaa  1200
gactttgccg aagactgaag ctccccttct gtaggtaacg gttcggacag tccgatcgaa  1260
ttcgatgcca tcataggcaa gtacccgata tggatgccgc atacgtagag attccatttg  1320
acgcaagacg gtatacggca aagggcgagt gagggtgaac gccactttcg acgttatccc  1380
tatacgggat atatcgttcg tatgggcttg ccctgtcata tctcggtttg cgacaggata  1440
ttcgtcgagc cataggcaag cagcccggcg tagcgtctac gttaccctgc tgcccctctg  1500
aaatatcccc tccttcggtg gggcggtttg ccttctgcga gtcggaaagg agtgaagaat  1560
agaccttggc aacggatgaa tacacttcct tcgtcggcag caaggcggaa ataaatgtta  1620
agtttgcttt gtctccgctg tgttgagatg ctattcgccg gagataggtt acattaagtt  1680
cagcttatta ttatggcaaa gagtgcacta catctgcgcg gatgtcctac cagcctaaaa  1740
tgcctgcatc tctgcaggga gcaggaagat aatagaagga aaagctacgg aggcggtttc  1800
ggacaaagaa gagttgctgc tattttttccc cgcacatacg gcttgccgct tatttctttc  1860
gccctggagg agagcggacg gagtatcctc ctacgaatgt gggggttatc cttcgggcgg  1920
acaggctccg ggtggacaca atgtgatagc cggtctgttc atgagatgaa gctgctcaac  1980
cccgatagcc ggctcttcgg atttcttatg gaccggatgg cctgatcgag cataagtatc  2040
gcgaactgac tgctgaggaa tagatgaata ccgcaatacg ggggcttcg acatgatcgg  2100
atccggagta ccaagctgga caagcccgaa cagttcgaag ccggactgga gatattcgag  2160
agttggacat caaggcattg gtcatcatcg gtggcgacga ctccacacca acgcctgcat  2220
cctggccgag tactatgcct cgatcgatgc cggatacaag tgatcggctg tccgaagacg  2280
atcgacggcg acttgaaaaa caacagatag aaacctcctt cggcttcgac acggccgcca  2340
aagtctatag cgactgatcg gtaatatcca gcgcgattgc aattcggccc ggaagtactg  2400
gacttcatca agctgatggg gcgttcggca tctcatatta cactggagtg gccctccaga  2460
cccaccccaa tatctgtatc gtatccgaag aggtggaggc aacaattact atctggacga  2520
tgtggtgacc tatatcgccg agaccgtgtg cgtcggtcgg aggcaggaat gaacttcggg  2580
acggtactga ttccggaggg ttgatcgaat tcctgccggc catgaagagg ttgatcaagg  2640
agctgacgag tttctctccc aaaatgatgc cgaattcaag ctcatcaaac gttcgcacag  2700
agacagtata tcaagaacaa actcagtccc gagaattcgc gccttacgac agcttgccgg  2760
tggatgtggc tcgacagttg attgccgatc gcgccctcac ggcaatgtgc aggtttcgct  2820
cattgccacc gagaagctct tgcagacatg acggctcaga agctggccga atgggcggaa  2880
gaaggacgat tcaggggcgg ttcagtacgc ttacccactt cttcggctac gaaggacgct  2940
tgccatgccc tccaacttcg atgccaacta ctgctactgt ctcggacgtc agcttctatc  3000
ctgatcgcag cgggaaagac gggctacatg gctgcgataa gaatacggca gatcctgtat  3060
ccgaatggga agccggcggc gtgcccagac gatgatgatg aatatggagc gtcggagcgg  3120
aaaaatgaag cccgtgttcg aaaagcattg gtggatatgg atggtgaacc gtaccgagca  3180
ttgcggagat gcgtcgcgaa tgggcgttga gcaccgagta cgtttacccc ggccgataca  3240
gttcttcggc cccgaacatg tatgcgatag ccccacgatg acatccgctt ggaaaagaac  3300
gatcgctgac tcttccgctg cattagtcgg gtgataagca gttgcttctg tttgttttgt  3360
cgaaaaaaaa tgtttttctt tcaataagtc tcatttaaaa gaatcgccta tcgacgcata  3420
tctaccttct aacaataaat aaagaggatt ctcctatgag cagtttccac aagctgacta  3480
tgatgaattg gtcagccttt atacagaagg atgcgatgag gctttcgagt catactgtcc  3540
cggtatgatg ctgtagttca tacttacatc cgtttttcgt gagcgatgcc gatttggcgg  3600
aggatatttt tcaggacact tttatcaggt gatccatacg cttcgtcgcg gacaatacat  3660
```

```
ccccaccggc aagttaaagc ttggctgcta cgccttgcgc acaacctcgt gatggatcac    3720
taccc.cgggt cagaggggaa ggagccagat tgcagtcttt cgatgatgac gacccgctcc    3780
tgtcgaaaag gtggcggaca gcaatctgac ggcggaagaa cactgatcga actggctact    3840
atcgaagagc tggaacagta cctgagcgtc cgcccgaagt gcagcaggaa gtagtgagaa    3900
tgcgctactg ggaggacatg gcttccgaga gattgcagat gctaccggag taagcatcaa    3960
tacggcactg gccgaatgcg atatgcgctg atcaatctgc gcaaaatgat gggcatgtgg    4020
cttagtcgat attccataca ataataaagc agtcgtaagc gttctctaaa gaatggaaaa    4080
aaggagaatg actcctttca tccttaaccc ttttgggaat atgcttatga cagacatcta    4140
ccgtattctt gatcacaaaa agctgaaatc gttttcgatg cagcagaaga gcgatgcagc    4200
ctcaaacaca aacaatcctt gacaagctca aacttatggc ccgttcacgt tgctcgtgat    4260
agcgctgttt cctttttgc acaagcaata aggaatagca tttcggagta tccctaatga    4320
aaagatatag cagccgaaac tgtgcagaga tatgaaaacc ttacagtttc ggctgatccc    4380
tttgtggata atcgtaactt tgcagcatta atataaaaaa gagttttag aaaccgatga    4440
aacccacact ttttgttttg ctgcgggtat gggcagccgc tatggtagtc tcaagcaatt    4500
ggacggcaag gc                                                        4512
```

(2) INFORMATION FOR SEQ ID NO:170

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 493 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...493

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:170

```
cattacagca agcatttcac gttcataacc tttgagccac cctctgagat gtccggtata     60
cgggccgcat cgaagtgccc cttgaaagca tatccgatac ctccgggaac cgatcatccg    120
ctgcgacgag gagaaatccg tctttcttcc tcgattgaaa acgaagaata gtgcctcctc    180
tctttctgca gctttgaaac gaaatccatc cggagactcg ctgtcgatga agacagcgtg    240
ggttgcgttt ggcaaaaaag ttcttagccg tctgttcggc tttggatcgt gtcacggtcc    300
tgcctggagc ataggggagac acagtaataa tagccctaag gtgagaagat acgtttcatt    360
attgcatttt gttttgttgt tcgaagcagg agggcagaag aagcgataat cccgtcatcc    420
tctttaagcc gcactaagat aaaaagagca ttattaagag tttgcagaaa gaaaaaaagg    480
gatacttgcg atc                                                       493
```

(2) INFORMATION FOR SEQ ID NO:171

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 687 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

```
(ix) FEATURE:
     (A) NAME/KEY: misc_feature
     (B) LOCATION 1...687

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:171

ggatatcttc cgtggtacgc tggacggtct gacggaagaa aaccgcctgg attcaacagg     60
cggatgtgcg gaggcaaatc gctgaaacac ctgttagagc actggcagcg cgggaaaccg    120
acgaaattaa agcagagttg ggacgcgcta cgaggaagag gagaagaggc tgaaaagcga    180
tgatcctcac cctgtcctcc gcttagctgg gataaagctc tgataggagc aaaggatcgg    240
atcatccggc taagaatcaa caggcttttt ggcagatgcg aggctgtcgg aacaagagac    300
cgtagcggaa ggcgatcact atttgtttaa ccgtttcacc gaagggagca gctttggagt    360
tgagagaggt agacagcgaa ctggtcatca aaggtttact tcggctttgc cctactacga    420
gaagtatgcc gtggcgcagc acgtataggg gagcggctgg ccgatcttct aacggctacg    480
gggcgtcacc tttcgaacat gtgctggaat acggctgcgg ctgcggtgtc tatacgcgca    540
actggctcaa accgttacgg taaagcagtg gacgctcaat gatttatgcc ggtctgcgag    600
gagtatatac gcgtaagctc tgtttctttc tatgcagcga agccgagaca atgccccaca    660
cggatactta cgatctgatc acctcgc                                        687
```

```
(2) INFORMATION FOR SEQ ID NO:172

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 766 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

   (ii) MOLECULE TYPE: DNA (genomic)

  (iii) HYPOTHETICAL: NO

   (iv) ANTI-SENSE: UNKNOWN

   (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

   (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...766

   (xi) SEQUENCE DESCRIPTION: SEQ ID NO:172

cgagcgtcgc tatccggcct tcggcaacct ggtgcctcgt gatgtggccg ccgtgctgcc     60
aaagaacgtt gcgatgccgg ttatggtgtg aacaatacgg ccttgccgta ttcctcgact    120
tcggcgatgc catcaaacgt ttgggaccga cgtggtggag cagaagtacg gcaacctctt    180
ccagatgtat gagaagtcgc agatgagaat ccgtacgaaa cgccgatgat gatctatccg    240
gctatcacta tacgatgggt ggtctctggg tggattacga gctgatgact accacccggg    300
cctgtttgcc atcggagaag ccaacttctc tgatcacgga gccaccgtct cggtgcttct    360
gctctcatgc agggtctggc tgacggttac ttgttattcc ttatacgatg cagaactatc    420
tggccgatca gattcaggtg cgcgcttcag cacggatcgt cccgaattcg aagctgccga    480
gaaagagttg aagaccgcat aacccgtatc atgaatgtca aaggcaataa gtccgtggag    540
accttcacaa ggagctgggc cacatcatgt gggacaatgt gggaatggac gagacaaagc    600
cggtttggaa aaagccattg tgaagctgga cgagctgaga aagagttctg gagcaatgtc    660
tatgtgccgg gtgaagccaa tgacctaacg tagagctgga gaaagccctt cgattggcgg    720
acttcatcga gatagtacgc tgatggcgca cgatgccatg gaccgc                   766
```

```
(2) INFORMATION FOR SEQ ID NO:173

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 661 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

   (ii) MOLECULE TYPE: DNA (genomic)
```

(iii) HYPOTHETICAL: NO

(iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
    (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...661

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:173

```
cggcaagacc tatacaacag cttctatcgc tgtgcatatg tgcaacaaga ctttacagat     60
tataccgacc acagcaaagt catagaagag tacgaacgct gagagatact ggtcaaatag    120
cattctgtac cttccaccag tcaatggtta tgaggatttt gtggaaggat tgaagccaga    180
agtgaaaagt aacaattgga atacaatgtg gaaaatggga atcttcaaat ccatctgtga    240
acaggaaaga caaaggaaga agcagatatc attacttgta ttgacaagta tctgagtcta    300
tcaagggtta tgaaaacaag aagaaaattc caacgatttc cggaggtcag atctgtgggt    360
atggtggata gagggtaatg acacaataag catcgcagtg ccatttctaa aagtgaaaaa    420
ggggagcagt attcactatc acacttaaca ttgagaaagt caagctgcag gcaattggtg    480
aagctataga aataactggc gacagtatgc acaagcattt atcaatgccg taaagaaagg    540
taccaacttg acaaacaaat ttcagacaaa ccttatgttc tcattattac gagataaacc    600
agagggtaat gtgtccaaaa tattcggaga acttatccct tacttgaagc tggataagcg    660
t                                                                    661
```

(2) INFORMATION FOR SEQ ID NO:174

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 840 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...840

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:174

```
ttgtgacaga ttaccatcgg cacaccgaga tgtttggcat agctattgga cgcttcgtac     60
ctccgacatc aggcgtagct actacgaggt tctctaaggc atattcttgc ggatgtattc    120
catgaaaacc gtagagccgt agagatgtcc accggcacat cgaagaaacc ttgaatctga    180
tccgcatgta ggtccacgtg atcagacggg taatacctgc cttgcttagc aggtcggcga    240
tcagctggcg ccgatagata cacggggctt gtcctttctg tcctgtctgg cccaccgaag    300
taggggatga cagctgtaat gtagtgtgcg gaagctcgtt tggtgcatcg atcatcagga    360
gcagcttcat caggtggtcc gaagatggga attggactgt acgaggaaga catcccggcc    420
gcgaatgctc tcctcatagg aacggcaaat tcaccatcgg cgaagtgctc gatattcatt    480
cgccccagag gcaacccaga ctgttgcaga tcttttccgc aagataacgg gaatttgtcc    540
ggagaagaca gaaaagttgt tttcgttgtt catctttgat atggtgtaag ttatcgttcc    600
attgccggca aatcgaagcc gtcagaccac ctccgagcga ctgctgacgg acatgatgca    660
aaagtaatat atatacatta tgtatgaagc tcgaagaaga aaagaagatc gggatgaagc    720
aatggcagag gcgttctgtc acgctcgatt cggctctatc gcctctgtct cgtgcctccg    780
cgccgcgtcc gttcgaagcg gtttttccct gtcttttgtt cgtttcggat cgacagaacg    840
```

(2) INFORMATION FOR SEQ ID NO:175

(i) SEQUENCE CHARACTERISTICS:
    (A) LENGTH: 910 base pairs
    (B) TYPE: nucleic acid
    (C) STRANDEDNESS: double
    (D) TOPOLOGY: circular

(ii) MOLECULE TYPE: DNA (genomic)

(iii) HYPOTHETICAL: NO

(iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
    (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...910

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:175

```
gatccccgtc cggtcggtgc cagcagttca caatctgctc cctgctcgaa atagtctgca      60
ccacagaagc gataagctgt gtcttacccg taccggcaat ccgcgaagca aaaaaccga      120
ataaggttcc ctgtcgaaca gatacttgcc aaagatcgaa tagccgaatc ttggctttgt     180
gtcggggtaa acggcaattt ttcaatattt gctcggccaa ataattgtcc atctttatac     240
aaatctatat ttgcggggac taagttactt cctttgaacg atatcctcgg attcgtgggg     300
caatacggat taggaagcgt ctttagaaga gattttaata caaacaaagt aagataacga     360
tgaagacttt aatcaagatt ttggtggctg tacagtcgtg gtgttggcat atctcaccgt     420
gatgagcata tatacccccg tagtttcgac aaagattcag gccagtccgt gaaacaagct     480
atccaaaaga gctgaaaaat atagctgact atcaagctgc attcgaaagc atgtatggtg     540
ctatgccaca gcagatgaat tggtaagctt cctcgctaac ggccgtgtta ctacgtgaat     600
gccgaaggcg aatacaccga cgacatgcgc gacaaagaat gaccgaagca caggcagctc     660
gtgcaggctt gctcaaacgc gatacatgtg ggttgcagcc aaggactctc tgctcaaagg     720
tattgacccc aatacgtctt ggacattccc ggttttgccg gcaaaaagat tttggttgag     780
gtagctccat ccaacaggag ataggtcggg acactataga tgtatccgta tttaggcatc     840
ggtacctttc gtcgactacc tcagcgatca ggatcagatt cgctgaagat gaaaataaac     900
gatgcagaag                                                            910
```

(2) INFORMATION FOR SEQ ID NO:176

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 1167 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...1167

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:176

```
tcctgggatc aagcaaattc aggtaggtga gcctagcccc taccagccct ttccaacttg      60
acagctacaa cgcagggtca gaaagtaacg ctcaagtgga agcaccgagc gcaaagaagg     120
cagaaggttc ccgtgaagta aaacggacgg agacggtctt ttcgttacga tcgaacctgc     180
aaacgatgta cgtgccacga agccaaggtt gtgcttgcgg cagacaacgt atggggagac     240
aatacggtta ccagttcttg ttggatgccg atcacaatac attcggaagt gtcatccggc     300
```

```
aaccggtcct ctctttaccg gaacagcttc ttccaatctt tacgtgcgaa cttcgagtat    360
ttgatcccgg ccaatgccga tcctgttgtt acacacagaa tattatcgtt acaggacagg    420
gtgaagttgt aatccccggt gtgtttacga ctattgcatt acgaacccgg aacctgcatc    480
cggaaagatg ggatcgcagg agatggaggc aaccagcctg cacgttatga cgatttcact    540
tcgaagcagg caagaagtac acctttcacg atgcgtcgcg ccggaatgga gatggaactg    600
atatggaagt cgaagacgat tcacctgcaa gctatactat acagtctatc gtgacggcac    660
gaagatcaag gaaggtctga ccgaaagacc taccgcgatg caggaatgag tgcacaatct    720
catgagtatt gcgtgaagtt aagtacacag ccggcgtatc tccgaaggtt tgtgtggatt    780
atatcctgac ggagtggcag acgtaacggc tcagaagcct tacacgctga cagtgtagga    840
aagacgatca cggtaacttg ccaaggcgaa gctatgatct acacatgaac ggtcgtcgtc    900
tggcagccgg tcgcaacacg gttgtttaca cgctcagggc ggctactatg cagttatggt    960
tgtcgttgac ggcaagtctt cgtagagaaa ctcgctatca agtaaatctg tcttggactc   1020
ggagactttt gcagacactt ttaagatagg tctgtaattg tctcagagta tgaatcggcg   1080
cccgacctcc ttttaaggaa gtcgggcgac ttcgttttta tgcctatatt ccaatatact   1140
tctgaaacaa tttgttccaa aaagttg                                       1167
```

(2) INFORMATION FOR SEQ ID NO:177

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 3217 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...3217

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:177

```
aacgattgtc ggctgattct tgcttcctgc acgatgcagg acgcgattgc agttgattct      60
tgctccctgc acgatgcagg acgcgattgt cggctgttct tgctccctgc atgatgcagg     120
acgcgattgt cagctgattc ttgctcctgc acgatgcagg acgcgattgt cagttgattc     180
ttgcttcctg cacgatcagg acgcgattgt cagttgattc ttgcttcctg cacgatgcag     240
gacgcattgt caactgattc ttgcttcctg caccgatgca ggacgcgatt gtcagtgattc    300
ttgcttcctg caccgatgca ggacgcgatt gtcagctgat tctctcccat caatgcgcta    360
actatcagct gtttgcaact attttatagg acttcattga agtcttttgc cgcagagctg     420
attcttaagt gttttttcaga tacttgaggt ttgcagagag atcgcatgaa gctctccttt     480
cttcgtcaaa caatgcttgt gtctgtcttg atcaatatga gagggggtta ttgtgcaacg     540
tctcaagctg taaaaccggc agctgtgtat agaaacagtc tttcggtgta tggcaatcga     600
acttcctaac tgcccaaatt ttaccggaca gcaataatga ttatatgggg ttagtccatc     660
gggcggactt tctcttcgac aaaggcattt cgctttcgtt taagccgtat ttgcggtaga     720
gttggcgatc aatttcgcca ccggctgtgt ccaatcgatg tccgattctg ctgtgaagtc     780
ttgcggggga ctaatcgcca agtttctttg gggttatctt gcgttgcctt gagataccca     840
gcatcgtgcg agcaaacttc gtcttacat agcgcagaca agctctgcct cgtttcgggt      900
gtcgaatgcc ccaatactaa tgaaggtatc atataaccca taatcggcgt gccaataatt     960
ggtgtgctga gtacttcacc attgcccccg agccatttgt cttggggata atcaccttgt    1020
acttggcaag ttctctggat gggtgatgta actacgctta caccacttat agcatcttgc    1080
ttattggctc gtccatagat acatgccatc ttctcttccc ttccttgggg tattcatcaa    1140
agaaaacctc aggaaacaca tcaaagatat tggcacaaag ctgtacttgt gccctgcact    1200
ttgtcttccg ttcaaatcgg gatgccttgg tagagttcgt ctgtaatacg atagagctct    1260
cgaggtgcaa caagtttgaa aatggtagag gattggtttg ctctacttta tacagaatat    1320
gataagctca tcaaaggccg aaaacatccc aatcggtcca agaatcattt tctgttccag    1380
tatgaggttg cgattcctcc ttttacatct acagtaggga aacctccgca ctattaggcc    1440
aataatcgac tactctataa tgcttgtccg aagcatcttt tcattccatt ctttgggcgt    1500
tttacctgcg ttgaaaagaa acgagcagga tgaataagtg taccctgtgg agcaagtacc    1560
attgcgagtc aaagaatttg ggtagatggg gtctgagcc attacccttg ccttgatcat     1620
cacttggtac ggtgggttgc ctataatagc gtctatcttc atatttcgtc gttgttgatt    1680
```

```
ttccagaacc ttttgcccga acgtagcata ttgacacgct gtcgggctgg ctggtaatgt    1740
tttctatcag atcgggataa tgcttgtatg agtcactaca tcacggaaac cccgtagcgt    1800
acgcatcgtg ataagcgggc cataggggtt ttgcagacca cgaaaatgtt ttcttcgagc    1860
gtctgtccca cagttgtaag gcaaaggcac gtgttacgtc gccatacttc ttcgagcttc    1920
ctctaccctt gtacgataaa tgttataggc agcataaagg gatagagacc gctcttggag    1980
ttgatctcca aaatgatgct tttggggtga atacctcatt cgttataccc tgatgctcga    2040
tgtagcgagg caatgcaagg gagtagagaa gtcttcgctc ataaagcagt agccacctat    2100
gctgtcccga gatgcatgtt caccacacgc caaggagtca gtactgtttc tttgtcgggt    2160
tgcggaaagt agagaagata gaagcaatac gccctatacg ctcctgatgg tgaacttatc    2220
cgccatacga gccatctcac ggatgcgctt ccccctcac gaaatatgtc ggggtcgtag     2280
taacgcttga agcgacgaaa gacgccttgg taacgccgcg aggcataaat tcctgccaag    2340
actgctcatc gagagattgg caaaattgtc aatggtcagc tccttatcct catccttcat    2400
tcagccccat agagcatcag aggcatgcgg atggatatgc ctcggaggat gaaatagcct    2460
ctcggcgttg gtcgcctttg gctttcagtt cgtccagtct tttttctctt cgggtgttag    2520
gcctttcttt ttcctcttct ccagtcgcct ttctcctcgt attgctcatg ggtgagacct    2580
tggtgattga tatctattca ccggactttg ccatcgcctt ggttttgcca atgatacctt    2640
tgagttgtcg aagtcgtgca gctctacctc ggtaagtttg agtagctcgt cattaagagt    2700
gccccattct caaagccatc ctgcaccact ttttctattt gtgccgcttg agctgtccga    2760
gcatcgtatt gacatcgtaa ggcttcatcc ggcgccttct atagagatga tgggacagaa    2820
gttgagaaaa tccccaaca gctgcgatca ctctcgctct gtttgcctgc tttgtatgat     2880
accttggcag ctcggcaagg acacggaggg tgcggtcggg agcaaagtcg aaggcataac    2940
ctctgtcttc atgtacccat tgtgggtata aggcgtttgt acgcggaagt agtttgcata    3000
tagccggatg cggaggtact atatgaaccg gccatcataa gacgccggtc caaggcttaa    3060
tgcttacacc ggtagtcagt cgtccgctga gagggtgatt gtataagtct catccgggtc    3120
tttgccgatg gcttgatgac taactcaagg gcatctctgc tttcctcctc ctcatcatct    3180
ccgtccccgg ccacattggc caccttaaag agaccga                            3217
```

(2) INFORMATION FOR SEQ ID NO:178

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 307 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

   (ii) MOLECULE TYPE: DNA (genomic)

  (iii) HYPOTHETICAL: NO

   (iv) ANTI-SENSE: UNKNOWN

   (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

   (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...307

   (xi) SEQUENCE DESCRIPTION: SEQ ID NO:178

```
acgctgatca acaagaaata cacgaagcga caaaatgcca tcggcgcccg gcttatgacg     60
tgattctctt attcaacgcc agttcgatct aagcgaacta ccataaaaat aacaagtagc    120
tgtaaatcat actcttttgt gattctcggc tgcataatga tcgggaagaa ggggcggctt    180
ccaagtcatt gggcttagat gtagataaaa agccatctga aagcaatata agtgtctgaa    240
aaacatgtgt ggaaaataaa acacactaat aaccaatgtg ttgtgccatt ccttatatcg    300
aactcac                                                             307
```

(2) INFORMATION FOR SEQ ID NO:179

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 2220 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

   (ii) MOLECULE TYPE: DNA (genomic)

(iii) HYPOTHETICAL: NO

(iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
    (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...2220

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:179

```
ggcccaaggt cgggagtttc gacggaggtt tcggttcttc ttatcttgcc gttgtgtagg    60
tcagaagaag acgagggaga tctggttttt atgccgtcgt ataccgctgc ggaggccgaa   120
gctatgggga tggtaaacaa ggtggtactg ccgcgaggtt ggaggacgaa acggtggact   180
ggtgcaagac gatattagcc ggagtccgat ggcgatccgg atgattaaac gggctttgaa   240
tgcgggctcg acggtcagag aggattgatg gagtttgcag gggatgccac cctttgtatt   300
atcttatgga agaagctcag gaggggaaaa atgccttttt ggaaagcgga ctccggattt   360
cgacaagttc cctaaattcc cgggttgatg ctaaggccga ttatatcccc tataccttga   420
aattcaagga gccggcaggg agtcgcgggg cgttttgcat accaagcaga cttatttcgt   480
gagggtatac acgatacttt cccctctcgg gcaggttacg gcgaggcggc tttattccgg   540
gattgagtgc ggaagaggga gcggattacg aagagcggct ggcggaggtt gcaacggcgt   600
ttgcgggttt actcccgacg cctggcaggc atatcctctt tgtgtttcgg gatggaaacg   660
gcgcttgccg acttcgaggg cggggggttgc ttttttccctc ggctttcact tccggcgagg   720
cggggattcc cataacggtt tgatatggat ggggagcttc gaagctatgc gaaggcgtgt   780
ggagagaaac tggaggaggg ctttccgctg tataaaactt aaaatcgggg ctacgatttc   840
gaatcggaac tcgctttggt acggatggtc cgcgagaaat tcggaaggat gccgttattc   900
gtctcgatgc gaacggggct ttcgaagaag agaggcgatg tataaattgg aacgtttatc   960
cgccttcggt atccattcgg ggagcaaccc gtcagggacg ggaattacgc ggctatgcgc  1020
aggattgcgc gaatgcccct gttgccgtgg ccttggatga ggaattgata ggcttataga  1080
tgaaacttcc aaacgggaga tgttggctta tatccgtccg gcctgtacgt actcaagcct  1140
tcacttgtcg gaggttttta cggcacggag caatggtaag gattgccgaa tccatgggga  1200
tagcgtggtg gatcacttcc gctttgagtc gaatataggc ctgaatgcca ttgcccagtg  1260
gacctatatt cacggaatcc cctgcctcag ggattgggta cgggcgcttt gtttacgaat  1320
aatcggatac gcctctttat acggaaggcg gttatttgag atatgccgca ggaagagatc  1380
ttcccgttgc gatgtcgagg ccttgttccg ggaaagatat gaaacggagg cttatgaaaa  1440
ttctgtatga agacaggtat ttcggttttgc ggagatagcc gccggcgcct tgggagatga  1500
tgttccgtgg aaatccgcat gcgtgcattc gtatcggaat ggtgcgattc acgggatttt  1560
atagaggtcg tacttccggc tctacgggta tgcccaagct tatccatctg cctaaaaagc  1620
gatggcggct tcggcacggc tgaccaatgc ttttttcgac atatccggga ttccgtactg  1680
atgctctctc ttccgctttc ttatatagcc ggtaaatgat ggtggtgagg gcattcgaag  1740
cagggccgt tctgttgccg gaactccctc ttctttgcct ctttcctccc tgcatacgaa  1800
ggtcaaactc ggacgctcgt acccctgcaa gtggaggaca tcctgtcatc gggggaaagc  1860
cacggttcga aaaggtggaa aatcttttga taggaggagg cccctggca cgactacgag  1920
agagcggttg gcggatattc ccaccgtttt tttcgctact acggaatgac ggaaacggca  1980
tcccatacgg ctcttatgcg attgaacggg agggagcttc cgcttgtttc gaggctttgg  2040
aaggagtgcg ttttgcaccc gggatatggt ggagctcgta gatgaaaggc atttcggtgg  2100
gggaatcgag ttttgcaccc gggatatggt ggagctcgta gatgaaaggc atttcggtgg  2160
aaggggcgtt tggattacgt aatcaatagc gggggatca aatttccccc gaggaactgg
2220
```

(2) INFORMATION FOR SEQ ID NO:180

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 2153 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
    (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...2153

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:180

```
tggctcatcg gctctctctc gattcggata tccaatcgta gagctatcgg gccggtgcag      60
gtctgcgcat gcgttcagcc acccgcgccg gtataagcgc gaggtcactg ctgctatctg     120
tatggctttg agcgaatcgc agaatgagtt catgatattg agaatgccat attgactatc     180
cgacgggtgg agcgcagtat tcaccatgga gttctaagat atatggactg agatctccta     240
tcgaaggcat atgttcacaa gtaaacatga tagacaatga aagaaaaaga taagaagctg     300
cccccactaa aaaagcaaaa gctactaccc ccaagaccgg aaagcgaaga aaggagctat     360
gacggacgac atctatgctg ctatctcggt ggtctctatc aagagaccta tgaagctcat     420
gatgctgaac ctatgaggct ccgatcaagc gtcatcgtca ttctgcttgg agcatgaaga     480
cacttatgct cgtcagcttc ctaaataatc tcattcaatc acgacattaa aaacatgaca     540
aacaatgaaa gagtataaat ataaaatcaa cggtaacgaa tacaatgtgt tatcaacagc     600
atcgaagatg gattggcaga catcgaagtt aacggtatcc ctataaggtg gaaatactta     660
ccgagaagaa aaaagcatcg aagcctcaat caaacatccg accgtcacgg ctgcacctgt     720
agcagctgca cccgtgctcc tgcagtttca gccggaggac aaggtacagg cgtcaagtct     780
ccgctcccgg tgtcatcctt gacgtttgcg ttaaggtcgg agacgaagtc aagtcggcca     840
aaaggttgct gttctcgaag ccatgaagat ggaaaataat ataatgcgga tcgagacggt     900
aaaatcgttg ccgtgaaggt caacaaaggc gttccatcct cgagggttct gatatcgtta     960
taatcggcta atgatatgac ggattcggca gcttcttagc aaacaatatc gaggtattcc    1020
tctcttacaa ggcttcgcca atgccacact cggccacttg gtgatgattc tggtcggatg    1080
ctattcattt ttctggccat accgtatgag tttgagccta tgttgctatt ccgatcggat    1140
ttggaatcct cattggtaat atccccttca aagatgcggt ctgcagatcg gtatttacga    1200
agaaggatcg gtgctgaata tcctcatcaa ggggtaacta aaggatggta tccgccactc    1260
atatttttgg gtatggtgcg atgaccgatt tctctgctct tatcgctaat ccgaagctga    1320
tgtgatcggt gcggcggcgc agttcggtat cttcggtgcc tacatattgg cttgtatctt    1380
gggttcgaac ccaatcaggc cggtgctatc ggtattatcg gggagcagat gggcctacgg    1440
ctatctttct ctcgtccaag ttggctccga cttgctgggt gcccattgca gtctctgcat    1500
actcctatat ggccttggtc cgatcatcca acctcctatt atgcgtcttc tgaccacgaa    1560
gaaggagcta tgattcggat gaaaccgcca cgtgccgtgt ctactacgga gaagcagtat    1620
tcccgatcgt ggggctgctg cttactactt ttcttgtgcc ttcgggttgc ccttgctggg    1680
aatgctattc ttcggtaata ttttgaaaga aagcgtgtta ctcgccgttt ggctgagacg    1740
gcacgtggcc cgttgatcga tgtcttacca ttctttttggg cgttacggtg ggagcttcta    1800
cccaggccac tcattcctga catggaactc gatcaagatt ttcattttgg gagctttctc    1860
ttcatcattg ctacgatggc cggtgttttg ttcgtgaaga ttctcaacct ctcttgcgac    1920
acaagctcaa tccattgatc ggcaatgcag gggtttctgc gtacccgact ctgcacgtat    1980
ttcacagatc gaaggcctaa aggccgatcg acaaactacc tgctgatgca tgctatggga    2040
cctaatgtag ccggtgtgtc ggctcggcag ttgctgccgg tatcctactc ggattcctcg    2100
cctaagaagt tccataatct caataagccg cccattgaac agacttttct gtc          2153
```

(2) INFORMATION FOR SEQ ID NO:181

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 943 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...943

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:181

```
tacagcttat gaaaaagtta ttctctttga gtgcggtcat cgtactctta tttccttgca    60
ttcttgcgcg cctcgcatca tcaccgagct gaacaaacgt accctccttt gcccgaggga   120
acacctattg cggtctacga actcgaaacg gtaagcgtcc cccttcggag gctgagctgg   180
tagggaaagt gaggatgccg aatccggtct atccccggga gtctctccta ctcggaggcc   240
gtgcaattgc tcgcgaagaa accagaaaaa gcggtgccaa tatcctgtac gtgacaatca   300
ccaacgaccc tctatcttcg gcagctccat gcatcagata ggcggcttat gctcttgtca   360
gattctgtcg tgaggaacga gggagaaggt tacccgactc gcccctgtac gattcgggtc   420
aaaggggggaa aatcggctct cgatcaaggc tcccgtacac gacctctcgc tccatttcgg   480
cccctctatc tcacgaatcg gacaaaaggg ctgtcttatt cggagcagca gctggagaaa   540
agctaagcaa cggactttcg ttcgtactcc aatataaatg tcacccgaag ggaacctcta   600
cggattcggt ctgatcgcct ctcgatatga agccgactca ctaagaaaat cgaataccag   660
ggtatcggat tcgccaatcg attggatata tcgctccctt attcagcatg agtactgctc   720
tttcggagcg gtggtgcttg ggataagttt cggcttaggt tatttgggct tcaaacaaac   780
gctgccgaca tatccgaccc gaagagggaa ggttacttct ccggcagcac agtggagcca   840
atacggcact caacgtagga tacaagctga acaaacattt agcatcgggg gagagatcat   900
gatggtcggt ggcgttttcc atccggataa ctaaagatga cga                     943
```


(2) INFORMATION FOR SEQ ID NO:182

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 734 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

   (ii) MOLECULE TYPE: DNA (genomic)

  (iii) HYPOTHETICAL: NO

   (iv) ANTI-SENSE: UNKNOWN   :

   (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

   (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...734

   (xi) SEQUENCE DESCRIPTION: SEQ ID NO:182

```
gaggatgtaa agaacgacat cttaccgata cgtgccgaaa gaataaagac aaagccaact    60
ctgcaatgat caatccccac agcaatccgg gattcatttc atagtatata tcaacgaact   120
cttagcaacg agcatggctg taagagcgtg ataccgagtg caccaaacat ccatgtaaag   180
acatggcgca tagttgcgtt tggagcgtac tatccacata gacagtggat tgattgttca   240
attcgtaaag ttcataccgc gtttcgttat ttgcttatat tttattattc tgttcctatg   300
gtaattcaac aaggatctcc ggtaaaggtt ccaccacttc accccccctg catcgaaata   360
ctctacattc tgatccatca tacatggctg gaatcctgtg ggaactcaaa tttctcttcc   420
gttgtatagc ccagcttggg acagcgtata cccgcttgag aaattcggca aaaataggca   480
acgcagaagc gcccctgcc cattggacat agagtcgaaa tgcacagacc tatcctcacg   540
ccaacccaac agccggccac aagagaagga gtaaagccta cgaaccagca tcactgttat   600
tctgtgtggt acccgtcttt cctcccatat cgagtttaat ccatagcgat acctcagtct   660
gctaccggta ccgccatcga ctacggcttc aacatataga gcatcttgta tgccgcttca   720
ggtgggagta cttc                                                     734
```


(2) INFORMATION FOR SEQ ID NO:183

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 669 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

   (ii) MOLECULE TYPE: DNA (genomic)

(iii) HYPOTHETICAL: NO

(iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
    (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...669

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:183

```
ccgtgcgcgt agagctaaaa tcctctatag ggataaaggt cgaatcagaa ctgtattttg    60
ctcaagcaat tggctataaa tagcattctg cgcttattga ttttgtttta ttatctgcat   120
tcccagaggg aagagtcggc tgcagggaat aaggatcgca gtggaatcgg tttctgcctg   180
tcgcacatcg ctcagcaatc cacaggcttg agttgccagc tccctatctg ctcgggcaga   240
tagaaaaagc acccaaaaga attgccgttg cagcaagcaa caaccaaaaa cgagcatttg   300
attacgcggg ccttccatag aataatcttg tgtcggattt ctctctttgt agaagaatca   360
aaaattgtgc gcaaagataa acgttacaca agaacttgta ttaaccatcc tgaaacgaca   420
ggacaatcgc atttgaaata tagcctgatg atgctccgtc cggaataaac acgaattaat   480
gtgttagaga cctaatagta gaaggaagag accaaggata cagagtacaa cctttcaaaa   540
cgatagccct ctgtcgaaga gaccggcctc ttcgggggaat tttctgtatc tgtgttgcgc   600
ttactatcgg aaattacaat cacgggtgtc tttctatata agaaatgagt cctgatcttc   660
ccaaacaag                                                           669
```

(2) INFORMATION FOR SEQ ID NO:184

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 821 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...821

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:184

```
tggccgaact ggctcagcag atccatgcag aaggtttctt ctttctcgcc tatggtcgat    60
gccggtctat cgggtcatga acgtcaggta ggacaaacgg taagactgtt cgccccgaca   120
tctacatggc ctttggtatc tcaggtgcat ccagcacttg gccggtatgg aagagagcga   180
ttatatcatt gccatcacaa ggacaaattc gctccgatct tccaggtggc cgatcttggt   240
gtagtggcga cttgcacaag attgtaccca ttctgacggc taagctgcgt tctgcatgca   300
ggacaagtaa gagcctgtta gtataacaaa ccttgtagag gagcgatgag gcgaagggct   360
tttgtggctc gtcgcattca ttcggctcct tttcatccat cgaagagagt tatggaattt   420
cacaatctga tcatccaatc gaagatggta tcacgacgct gaccatcaac aaaccggaga   480
cactgaacgc ctctcctctg aagtcctttc cgaattgaag tcggccattg ccgttatcgt   540
acagaaaagc ctcgagtgct gatcattacc ggaagcggca aagcattttc gcaggagcag   600
acatagccga gatgcaacat ctgagtgcag ccgagggaaa gcctttggag ggcttggagc   660
agaggtattc cgaaggatag aagaatgcct ttccctgtta ttgcagccat caatggcttt   720
gctttgggag gcggagcgaa ttggccatgg cttgtgacat ccgcatagct tcggcttaaa   780
gcccgtttgg tcaagcccga agtcggattg ggcatcaacc c                       821
```

(2) INFORMATION FOR SEQ ID NO:185

```
(i)   SEQUENCE CHARACTERISTICS:
      (A)  LENGTH: 803 base pairs
      (B)  TYPE: nucleic acid
      (C)  STRANDEDNESS: double
      (D)  TOPOLOGY: circular

(ii)  MOLECULE TYPE: DNA (genomic)

(iii) HYPOTHETICAL: NO

(iv)  ANTI-SENSE: UNKNOWN

(vi)  ORIGINAL SOURCE:
      (A)  ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix)  FEATURE:
      (A)  NAME/KEY: misc_feature
      (B)  LOCATION 1...803

(xi)  SEQUENCE DESCRIPTION: SEQ ID NO:185
```

```
gctgcgatag cgtcagttcg acgtgagaaa aggaaaggga gctttagcgg cagaggcagg       60
attgctattt caatatatcg gataagccgg cgaataatcg aaaccggata tcaccataaa      120
aataacggct acgatgcggt tgaaccacgt atgccaacga cattgatacg attgcgtagc      180
aggctgaaaa gataaggata agagaccacc agccaatcgc ccccaaagct atacctaaca      240
tgccgaggta taaccgacta acatcctccc cggaacatng gtgacgaagt tgaacgggaa      300
tatagagcga taaaaaagaa aatgataaaa gggttggata gcgaaggcca aaagagctta      360
ggacggtatg ccatacagag tagttattat cctatcatcc accttgaagg tgggtgcagt      420
ccgatacaga tatataccga aagaaacatg acgacactgc cgagaagctg tagccaagcc      480
tcgttgcttg caatgaagtt catcaccaaa cctattccca gatacgtgac agtggcataa      540
agagatcgct aagtatggct ccgataccgg tgtagaatcc atcgcgcctc ccctgtgcag      600
agtccttcga atacacaaaa ttccgatcgg ccccatagag ccgacacgag aatgccaatg      660
agaataccgt atagaattga agtggcacca tgccgtagaa aggcaaaatt tccttattgt      720
cctgctaagc cggatgcaaa gataaacatt ctaccctgtt atatcctaat ccgttttttgc     780
cggattcttg aaaagaaaaa gtc                                              803
```

```
(2)  INFORMATION FOR SEQ ID NO:186

     (i)   SEQUENCE CHARACTERISTICS:
           (A)  LENGTH: 3910 base pairs
           (B)  TYPE: nucleic acid
           (C)  STRANDEDNESS: double
           (D)  TOPOLOGY: circular

     (ii)  MOLECULE TYPE: DNA (genomic)

     (iii) HYPOTHETICAL: NO

     (iv)  ANTI-SENSE: UNKNOWN

     (vi)  ORIGINAL SOURCE:
           (A)  ORGANISM: PORYPHYROMONAS GINGIVALIS

     (ix)  FEATURE:
           (A)  NAME/KEY: misc_feature
           (B)  LOCATION 1...3910

     (xi)  SEQUENCE DESCRIPTION: SEQ ID NO:186
```

```
gggagagcgc atagcccgat ttgcagatat agaagtactc agctatcgac cgacctcttc       60
ggcacattga cccctaagca gaggatgctt tgctaccact atcggaagca gccctgcgag      120
gacgggatat tacaaccata cagaactccg ctacaacctc tgggtacgca gtctgatgga      180
gcgtatttac acccatttag caagtcggaa cgaaccgacg actttgccc tgctggaaga       240
atacccttct gcatctggtt tgccaatggc attcaccacc attacagcgg agccaattca      300
ttgcccgttt cagtccgggt ttcttgcggg cagccctgag agagcgggcg tggagctgga      360
gccggaagag caggtgcttt tggagcgcgt atgtacgata cccgattttc tacccaaaca      420
gaccgagcag agcggcgaag agatattatc aaggcttctt cggtcaattt ctatgcaccg      480
```

```
ggtatcaccc agcccgaagc ggaaagccat tacaaaaacc tgatagaagc tcttcccgaa    540
acgagaaaag ctgtccgccg agcttcggac tgaatacccg tctgatcctt cgacttcggg    600
cgaattgaaa gacgaggttt gctgtataga cggattgacg gcccggccat agaagctgta    660
gtcgcttcct tggaggctgc catacctaca ctgagaacga ggaacaggcc gcatgcatac    720
gactgctgtg cgactttacc gcacaggaga catcaggctg tacgaccggt tctgtattcg    780
ctggtggaaa acaatcgtac tcggatcgat tttatcaacg gattcaccga agttatgccg    840
atccgatagg catacacggc agttgggagg gactggtaca cagcaggacg aagaagccgg    900
cagacgtacg cgcatcatca gcgaacatgc cgttggttcg aagcacattc gccgatcgac    960
gcacgtttcc gcaagaagaa ccccatggta tatcggctac ggtggtcaat gtactgacca   1020
tagccggcgc agctatcctg ccacaccgat aggaatcaac ctcccgaatg ccgactggtt   1080
cgtgccgaac acggatccaa gtccgtcact atcgacaata tcacggagca tacaaccatg   1140
ccgcgcgagg gacaggtctg tacgaggagt ttatcccgac gaggaagtac gcagacacgt   1200
agagctgcat gccgacctaa cggacgcctc cacaccgacc tgcacgaatg cctcggacat   1260
ggcagcggac agttctcccc ggtgtaccag gcgatgcact tggagaacac gcctccacgc   1320
tggggagacg cgtgccgacc tcttcgccct ctattttctg gccgatccca aatgatcgaa   1380
ttaggtcttt tgaccgatcc cgatgcttac aaagccaact atacaaatac atgctcaacg   1440
gtctgatgac ccaactcgtg cgtatcaagc aggagaggag atagaggagg cgcatatgcg   1500
caaccgtgca ctcatagctg ctacgtcttg gagcatgccg agcggccggg ggcaatgtcg   1560
ctggtctgga agagggcaag acggcactcg tgatcaagga ctatgaagca gtgcgtggat   1620
cattgccggt ttgctgaccg aggtgcaacg catcaagagc gagggcacta taccgccggc   1680
aaagcgttgg tagagcgtta tgccgtccac gtggaccgct cttgcacgag gaagtgctga   1740
cgcgctatgc caagctggat attgtccgta taagggattt gtcaatcctc ggttgagacc   1800
cgtatataat tcgagggcag gcttacggat gcaacgatag aatacacgga aggctatgcc   1860
gacaaatgct tcgctacagt gcagaatata gcttcctgcc tacagacagt cgcttttgca   1920
ggaggcacga agattgcgct cgcacctccg acgggcgatg acggtgtact atcggccagt   1980
atgcgtgaga aaggactcca ctacggcata actttggagt cactcgcgaa catctgctcc   2040
gactggctcg cacggccgcg cttccgctcc actggccgac tatctgtgga gacgcgatgt   2100
aagggagcga agatactcgc cacgatgatt tttccggccg aagaactgac tcatgacagg   2160
caacgagatt gctccgagag gccgacaacg tggaacttcg cgagcactga cagccaatct   2220
gctggagcga atgcccgaag cgatccggag catcgccgat ggatcgagag caaagagact   2280
actcctgaca tgatgacggg agtttgacgc ttgcagccag attgtttaca cgcggcatct   2340
ttccggaaga cggccggcag agaaactctt aacactggcc attctccatc tctccgatga   2400
gagcagaaag cggagcttcg gcgcgcttcc gcacttctgc tcaagcggta gggcgaggct   2460
ccgcagaacg gacaaaaaaa gtgctgtgcc tattgcccga tcgagccaag acacagcacc   2520
ggttttgtat gaattatgtg aagatatcgc ttcgaactcg acttctaccc aaaggacgag   2580
taagagaagc gactatcatc gatcatcgag aagcctgtat aaggcaccag acagtcgggg   2640
atgcggtgcc atcggctgtc tgattgtttt ccagcagagc agccacgata cgcggaaggc   2700
caaggcacta ccgttgagcg tgtggcaaag ctccactttc ttatcgcatt gcgataacgg   2760
cacttcagac gattggcttg gaagctctcg aaatggacac cgagctaacc tccaaccacc   2820
gctcttgggc agccgaatag actcgaaatc gtaagtcaat gccgaagtga agctgatatc   2880
tccgccgcag agcgaaggat acgccacgga agtcccaact tatctacaag gccttggaca   2940
agccgaccat ctgatcgagc tgttcgtagg agtgttcggg cttgtcgatc ągacgatctc   3000
caccttgttg aactgatgga ggcggttcag accgcgaaat ccttgccgta cgaaccggct   3060
tcgcgtcgga agcaagccga gtaagcgtca ggagaatggg caattcgtcc tcggagagaa   3120
tgacatcgcg gaagatttgg tcaccggcac ctctgccgtg gggatcagat acaggttgtc   3180
cgccggacat ggtacatctg cccttccttg tcagggagct gtcccgtacc gtagcggaat   3240
cctcattgac tacatagggc ggctctatct ccgtgaagcc ggcttgcggg cttcatccaa   3300
gaagaagttg accaaagctc gctgcaggcg tgtcctttgc ccttatagac agggaagcct   3360
gctccggtta tcttgacgcc ggttcgaagt cgatcagatc gtatttcttg gccagatccc   3420
aatgtgggag ttgtgcgttc caagctccgg cactgtgccg cctgtcttca cacagacatc   3480
tcctctgcgg tcttgcctgc agggacagac tcatgcggca gattcgggta agcagaagct   3540
gttggcgtat agcattctcc agatcagctt ccgctctcc agatggtggc tcccggcttt    3600
catatcggct actttcgcac ggatggctct gcctcgtctt tcttccggc tttcatcaaa    3660
gctccgatct ccttgcaatg gcgttttgct ccgccaagcg agcatccaga ctctgttgag   3720
tttccgtcgc tgtctgtcga gagagatgac ttcgtcgaga atagcagctg catgaagtgc   3780
ttcaccgcca agcgacggat cacttcttcc ttgtttttcta tgtttgcttg agtgtcagca   3840
tagtatatcg aaaaaaacaa aaggcaaatc ccaaggcggt ŧacagcctgt agagattcgc   3900
cccggggatc                                                         3910
```

(ii) MOLECULE TYPE: DNA (genomic)

(iii) HYPOTHETICAL: NO

(iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
    (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...1111

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:187

```
gcgatatact tgatggcata gtcaagcgaa acggaaaggg gttcggtatt tttggcaacc      60
ctacaaactt gcctgcatgc ttgatataag ggccgaaggt cctacggcta ccattacatc     120
cgcatcctca tattgtccca gtttcttggc aggaggaata gttccaaagc ttcctccagc     180
gtgatggatt cgatggctgt cccggctgga gcgaggcaaa ctgcgccttg ataccgtttt     240
ccttaccgtg cgacctttct gcaccatcgc tccgtagcgt cccatttttg ctacacagat     300
tctccggtca caggatccgt acccagcatt ctttcaccga tctctggtcg ggatcgaact     360
cgcatgcttc tgccaccaac gggtggaatt tgtgtagaac cgaccgatct gcttctgcca     420
ttgcagtttt ccttcggcta ttggtcaaat tcttttttcca ctttggccgt gaagttgtaa    480
tcgatcacct agggaacgaa gccacgagaa agtcgttcac cacaagcccc atatcagtgg     540
gaggagctta ttccggtcct gtccgttcag ttccgttttg atcgtctcgt tatggctttc     600
cccttgtggt attccagcag gatgtattcg cgtgtttgcc cggtttgtcg ccgcgtacta     660
cgtattcgcg attctgtatg gtttggtagt gggggcatag gtggatggcc tgccgatgcc     720
caactcctcc attttcgaac gaggctggcc tccgtatagc gtgccggacg ctgcgtgaag     780
ctctcgttgc ttttgcatga tgcagagaga gcgtatcgcc ggctttgaca gaggcaatag     840
ctgctcctcg gtatttgcag agccatgttc ttcgtccgaa tctcacgata gactccgagg     900
aacccgtcga atacgatcac ctctccttgc ggctgagggt ctctgcaaac ttgtcggttc     960
cgattgttat cgtcgttttt cgaggatggc atccgccatc tgggaagcaa tggttctgcg    1020
gcggatcagt gatatagctt ttgctctttg cngggtgccg tctatctctg ctctatgtta    1080
taagtaggac ggatggcttc gtgggcttct t                                   1111
```

(2) INFORMATION FOR SEQ ID NO:188

    (i) SEQUENCE CHARACTERISTICS:
      (A) LENGTH: 823 base pairs
      (B) TYPE: nucleic acid
      (C) STRANDEDNESS: double
      (D) TOPOLOGY: circular

(ii) MOLECULE TYPE: DNA (genomic)

(iii) HYPOTHETICAL: NO

(iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
    (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...823

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:188

```
tctgcggatc agcaacggta cttccgcgac ctcggcaaag agtatgccgc atcaaccctc      60
ctttctccga acagtgaaag acnacggcag gcttacagat cggactctct tttgaatatc     120
cccatcttct ctgccatgca aacgcaaatc gcgttcggag cagtcgcctg caaatacgct     180
caagcgagct tcgactgtcg aagagaaaaa agccctctat aaagagatca ggcaagcata     240
cagcatgccg tggcagccga taaggccatc gcagcagccg aaaacagcaa ggccctacgc     300
tcaaggcata cgaatacgct cgcgacagct tcgaggcagg gcgttgtctg cctacgaata     360
tgccgaggca aaaacaaaat acgccctcag ccagtggaag aacttcgtgc caagtatgac     420
ttcatataca aagccaaagt ttggatttct atcagggcaa agacttctaa aagactcaca     480
agaaagctat tttgaaccct cagcgaggtg ttcatgagat ctatcaggac cccgacatct     540
```

```
agggtgctgc gtcaaaattc gttttgccac agcacccttt taacgtcatt cgacgtaaga      600
aaacgccaat gaataattct tttcctgatc agagattatg ccctaagatt ctccggcaaa      660
tgtatagggg gtatcctgct tctgctggat cgaaccaaca ttgaaattcg gattgctttt      720
gacagaatgt tgcagccgca caggaagatg ggctatacca cagggcaaga tgccggtact      780
ccgtgaggat gatgggctac ccccgtatgg ctcttcgagg tac                        823
```

(2) INFORMATION FOR SEQ ID NO:189

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 563 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...563

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:189

```
ccatggcact ctgatgatcg ataattccag tgctttccgt atgcaggaaa cgttcccctc       60
gtggtgccgg aggtaaatgg ggatgatgcc ttggtacacc tcgcaatatc atctccaatc      120
cgaactgtac aacgattcag atggtggggc actcaagccg atagaagacc tttctcacat      180
acgtcgtgta cacgtgccac gtatcaggct gccagtggtg caggtgcgct gggtatggcg      240
gagttgtaca gcaggcggaa gagttggctc ggggagagaa gcctaccgtg gacaattcgc      300
ttaccagttg atgtataacc tgattccaca gatcgacgtc tttcggacaa cgactacacc      360
aaggaggaaa tgaagatgta tcgcgagacc aacgtatcat gcatagcgat gtgatggtga      420
gtgcaacctg tgtgcgtgtg cantgatgcg tgcccacttc gaggctattt gggtggaaac      480
ggaacgcccg tcgctcccga agaagctcgt gcagcctttg ccaaagcttc ccggagtgtg      540
cttgtgccga tgagcccgtt cag                                             563
```

(2) INFORMATION FOR SEQ ID NO:190

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 442 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...442

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:190

```
taggtattta atgtcggatt tatactaaat aagtggtatt gggaatactg aattgcacat       60
gaaaaagccc tcgatacata ggtgctttta ttcatttata tttgtgtatc agccgattat      120
tccgtgtgtt tatggtatga tcaatgaaca aagctatggc acgacaagga aaatcatcta      180
```

```
atgaggcctt tgaaaagaga aggttatcgc ttaggttgca acttatacaa agggatgaga        240
gtggaaccgt gaacatactt cttgcggcag cagcctatga actcaagaga gctagaaggc        300
tcttttggac tttatcaaaa caatctgcga gatactgttt gctacaatat ctccctaaaa        360
gggacttttt aggggatgac tatataggga gttaaacaaa gctatatagc aatcggccca        420
atcctatata gcaatcaaac ga                                                 442
```

(2) INFORMATION FOR SEQ ID NO:191

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 522 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...522

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:191

```
ggctgagagg tcaattcaat ttccactctg caccgtcttt cgtatcttta tcgtaaatcc         60
cagagccgtg agttcgtcgc ggatcttatc gcttgtcgcc aatccttacg agctttggct        120
tcggctcgga tacttaggag cagatcctcg ctttgccgaa ggcttcgctg ccaccggctg        180
aagacgccct ttcatccgca taccaagcag gtcgaacagg aagaggcgga atgtagtacg        240
cagttctcta agttggaaga agtaatggta ccttgtccat tgtgtacagc attattgcgc        300
gcgctgcatc gaaaagggct gctattacca ttggactgtt cagtcatcgt tcatggcatc        360
gtagcaacgc ttacgcagat cgccaacctc taggaggtcg tgtcggcagt cttcaatcca        420
tcgagcaagg ctgctgcatc cgcaagcgct ccaaacctt ctctgccgct tccagagctt         480
cattgctgaa tctacagtgc ctcgatagtg ggctccgaga at                          522
```

(2) INFORMATION FOR SEQ ID NO:192

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 1137 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIYALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...1137

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:192

```
gggccaaacc cgtagcagga atgaaaagaa gcagaaagag gatccggaaa tccggatccg         60
gtgcaaggat gttttcattg tttctttcgg attatcgggt gtttcgaaca ggcgttccag        120
actcatttcg tcttggatca atacctgctc ggtttgctac cgtcctgcgg cgaaacgata        180
ccggcacctt ccagttgtcc atcaatcgcc ctgcacggtt gtagccgata ttgaactttc        240
```

```
tctggtatta gaggtagatc cctgttgtga gtttactacc attcgggcta cttctcgaag     300
agaggatctt tctcctgcgg attgaatgct ttcggtcctc cctttcacct tcgggcacat     360
actccggcag ctcataagcc gaggtatagc ttcctgtagc gaaatgtggt gagtgacggc     420
ttcgcactcc ggagtatcga gaaagcgcat tgcagacgta ccgtgtcttt tccctgatag     480
aaaagcatat tccacggccg acgagctgat tggctcccgg ttgatccaga atggttcgga     540
gtcgatcatg gagaatactt tgaaggcgat acgagcagga aagttcgctt gatgataccg     600
gtgatgatgt ccgtggaggg ccgttgggtg gctaccacat gtgaatacct gcggcacgcg     660
ctttctgggc gatgcgggta atcggagttc tacctcctta cccgatgtca tgatcagatc     720
ggcaaactca tcgacatcag cacgatatag ggcaggaatt tatgaccgtg caagcggctg     780
agctgccact gataatctga tcgttgtatt ccttgatgtt ccgaacccgt gctccgtcag     840
catgcggtag cgattgtcca tttcgatgca gagagagttc angtgggtac caccttggtc     900
atatccgtca cgatggctct gtcctcgtcg gaagcttggc cagatagtga cgttcgatgg     960
cttcgtagac ggcgaactcc gcatcttcgg gtctacgagt acgaacttca gttcggccgg    1020
atgcttcttt acaagaggga ggtgatcatg gcattcagac ccacggattt cccttgtccg    1080
tagcacctgc tatcatgagg tgaggcatct ttgcaaaggt cgaagataac acttcgt       1137
```

(2) INFORMATION FOR SEQ ID NO:193

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 5366 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...5366

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:193

```
aacgggggag agactctgct ccggcagatg ggcggccaaa gaggcggcaa gtcggaagcg      60
attcgctcca cgaggctctc ttcgcctgct ctgaactcat tcgtatcagc cggctaaaag     120
gtgggaagaa aagcatttgc ctttcctcaa ttgtttttccg ataaaagcct tataatcacc     180
ttctcgcaat aaatccgaaa ggagttggcc ggattgttcg tttgtatgta tagacgggag     240
gctccctcct aagcatgagc tgatagagta gctgataagc tcgttcgtag gcgcgaaatc     300
cgggaaaccc aatatgctgt ccagctgggt gacggctaca agactacatg ttcgttatag     360
acttgcccct tgatcagttg cgtgccaaca agatatccac ctctttcgct tccagacgcg     420
ccagagcttc gtccatcttc gtcggctcat ggccatatcg ctgtccattc tgaggataga     480
gacggtgggg aacgtctttt aagctcttcc tctattcttt cggctccata ccccacaggt     540
gcaggctgct cggctctcct acgcccgatg cccgcttgca ggagggacga tgcgcggaag     600
gggtctgctg tagccgcagt agtggcagac gagcataagg aatgcttgtg ataggtgaga     660
ctcacatcgc agtggatgca acggagtttt ccccacaaga gctacaaatg atatacggag     720
cgaagcccct tcgatttgga ggacgacggc cattttttttt tgccgaatcg tctcttcaat     780
agctagacga gggggaaaga aagcagttca cctgcaccga cctgtctttg acgcgcatct     840
tgcccatgtc tatgacttcc aaatcgaatc gggggcgaac ccatcgtccg gccaggtgat     900
cagttcacag gctttgtggc gcacttggtg ggcacctcgg cagaaggagt ggccgaagcc     960
aacacaacag ggcagtcgtg atccggccga gtcgagctgc cacctgtcgc gtatggaatc    1020
ggggggcaga tcctgctgtt tgtagaggta ttcctgttcc tcgtccacga taatcaatgc    1080
aagcgacgga atggcaggaa aagtgccgat cgaacaccca gcaccaccaa ggatattccg    1140
ttgtggccaa tctgttccac acttccaccc ttttggatcg ctttcaaagg catgatagga    1200
tagcaaacaa ctgcccagcc tctcgccata cgtgtggaca gagtatcgct tcctcctcgt    1260
ttgttcgctt ccgggagagg tacaggactt ggcctcctga acggacaact tcttccgtcc    1320
atttaagagt tgttttttctt tgcgtcgaaa gtcatgcgta tagaggagag aagaggtttt    1380
tgaggtagag aagccgatac tgcggagtct gtagaactct ctccgattga atggcttttt    1440
cttcctcttg gggctgctcc cacaagcggt ctcacctccg ccggccgaat acatgaccga    1500
gtgtgtaaca gattcggatg aaaaatccct ttctttttca aagcggaaag ggtgactgta    1560
gcatgaggtc ggactccgcc agtagccttt gcggcatcgg agaggaatat gggaggggtg    1620
ctctgttatc agctctgccc aatgaagcaa aagggcggat tgcttggagc acgatgcaaa    1680
```

```
ctatccagaa gcgaggcaaa agtcttttcc gtccgaaagg ctctgccaga cgaacgaata   1740
cttctgactt gggcttataa cggctttttac ttcttcctcc agccgtatgg cccctcgttc   1800
gaccaaggag gtaaagcgcg aatcgctcgt ttgccgacag ccttttgcag ggcgtcaagc   1860
gttaggttcg tccttttgcc gactccaaaa tatcgaggag ctcctcttca tacgactaag   1920
ccggctgtcg gcttcgaagt ccgtattata atggatgacg tatggctctc gggtagtaat   1980
gctgcaggca gagcagcacg gagtacttcc cctgcgtaca tatgtaataa gccgacagcc   2040
actgccacag actcagcttg aggcagtaac tgacggctta tcgtcaggca ggaagagaac   2100
ctccttgatg aaatttgcag attgggacgt ttgtcggaca gtccgatgat aatcccgtat   2160
agtatcgctt ggctccgaaa ggtactacgc aacgcatccc cacgaagcct tctcggctaa   2220
cccctcggcc aatcggtagt gaaaactacc ctcagagcca agggaatgag gacttcggca   2280
tagcgcatag ctatcttctc ccttcatctc ggagtcatgg ctatgattcc gctttcagat   2340
attcgtgcat ggagctgctg ctttccgtcc atcgcccatc gccaatatca cagtggctcc   2400
gcacgaacga tgtcaccacc ggcaaaaaca tcggggagag ctgtctgatt ctctcattga   2460
cgacgatggt tcctttgctt gtcacttcaa gaccggaaaa gttcggggaa cgagcggatt   2520
gggcgataca ccgatactta caatcactcg tccaccggga tctcctcgat agccccgtg   2580
atcgcaacag gacgacgcga ccacctgcat ccggctcgcc aagctccatc ttttgcaggc   2640
gcatcgagtc actcggcctc gttcattgcc gatatattcg ataggattgt gcagttcagg   2700
aactctattc cttcctcctt ggcgtgcttc acctcttcca atctgccggc atttcctctt   2760
cgctgcgtcg atagacgatc atggcacgtt ctgtccgagg cgtttggccg tacgaacgga   2820
gtccatggcc gtattgccgc cccgatgaca agctacattc ttgcccttga aaacgggtgt   2880
gtcgctgtcg gttggctcgc atgcatcaga ttgacgcgcg tcaggtattc attcgaagac   2940
tgactcctac aaggttttca cccgggatat tcatgaaatt gggcagaccg caccacttcc   3000
tacgaataca ccgcgaaatc ctgcttcatg caggtcatgt atgcgatcgt tcggccgaca   3060
atcgtattcg tctcaaagcg tacgccctct cttcgagaag attgatctcc gaatcgacta   3120
tactattcgg aagacgaatt ccggaattcc gtacttgagc actcctccga tttcgtgcag   3180
ggcttgaata cggtcacgtc atagcccaac ttggccatgt ctccggagaa agaagtccgg   3240
ccggaccgct tccgatcaca gccactttga taccgttgcg agggccattt cgggaacttt   3300
gagtgcgccc tgttcgcgtt cgtagtctgc ggaaagcgtt ccaagaaacc gatggcaaca   3360
gccggtttgt tcattttcgt aagatgcacc ggctttcgca ttgcttctct tgcggacaga   3420
cacgtccgca accgccggca aagagcttgt ctctcgcaaa gtagatgctg cagccagtaa   3480
tcgcctactt ctatctgctt gataaaggtc gggatattga tactcacaga catccttcca   3540
tacagctcgg ttgcggacaa tcgagacaac gagaggctcg gccatagcgg cctcacggga   3600
caaaccgcga ttcacctctt cattgacttg gagctacgat agaggggtc gagttcgggc    3660
atttcagccc gtggagcgac atgcgttctt tatttttgag cgcgttgcgc agctcctctc   3720
tccaggttca gagcgacgca gtcggataag ttcttctgta gtcatgtcaa taagcagaaa   3780
ataaggttat tccatctctc ggtatgcgcc caaacgcatg atatctcatc gaaatccact   3840
tggtgtgcat cgaattcggg gccatcgaca cgacgaattt cgtctgtcct cccacgctta   3900
tacgacaagc cccacacata cggtgccatc caccataatt gtattgagag aagctatggt   3960
cggtatctct aacgtttggt caggagagaa acgaacttca tcatcacagc cggcccgacg   4020
taacgcagag gtctaccgtt tcccgtttga taacgctttc cactccaccg ttacgaggcc   4080
tttcgtccca taagacccat cgtctgtcat gatgatactt catcgctatt ggctcgcatt   4140
tgttcttcaa ggataaccag atcttagttc tggcagccaa tacgacaatt atcacggttgc  4200
ctgctttgtg gaaacctcca cgatcgggag caaaggagcc acacccacac cgcctccggc   4260
acaaccactg tgccgacctt ttcgatatgc gtactctgtc ccagcggacc tacacatccg   4320
tgatatagtc gccgacttcg agttcggcca atttcttgga aatttgccca cggcctgaac   4380
cactaaggta atggtaccgc gctttatgtc gcctgtgcaa tagtcagggg gatgcgttcg   4440
cctttttctc caacgcggag attacaaaat gtcctgctct tcgcgatttg gctatacgag   4500
gagcctctct tccagcttga tcacattagc cgagaagtat tctttggata cgatttttc    4560
atagtaacag tcacatttgc ccgctgctaa ccgaagcgtt cggccgaaag gtaagaataa   4620
tccgggggga gtagacagga caaagaaaag gacactccgt tggagagctg agggagcgtg   4680
gcagtcacat gggaatacca tcggggaaac ggataaatat ggtagttttg tctgtaaata   4740
agtaagcata aacccataat gcgcattgat ataatcaccg tgctgcccga aatgatcgaa   4800
aaacactcaa ctgctcgatc atcgggaggg cacaagaaag aggactgctg gactgaaact   4860
gcaccagctt cgcgactatt ccaccgataa atggaaacgt tggacgacta tccattcggt   4920
ggagagcccg gcatggtgat gcaaatagac cgatcgaccg gattatcacc gaactgaaaa   4980
cccagagaga atacgatggg tgatattcac ctctcccgac ggtgagcgtt tcgaccaacc   5040
gatggccatg aactgagtct cctatccaat ttgattgttc tttgtggaca ttataaggga   5100
tagactatcg tatcagggaa catttgatca ctcgtgagat ttcgacggcg actacgtact   5160
caccggtgga gagttggccg ccgccgtgat gaccatgcga tcgcccgcct catccccgga   5220
gttctcaacg atgccggcag cgcctgtccg acacctttca ggacaatctg ctggcccctc   5280
cggtctatac ccaccggccg agtataaagg ttggcgagtg ccggatattc tgctcagcgg   5340
aatgaagcca atatcgccaa atggcg                                          5366
```

(2) INFORMATION FOR SEQ ID NO:194

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 366 base pairs

        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...366

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:194

```
gttgaatgta nagactgaat tcggccgatt cttcggattc gaaacgctgc ggctttctat    60
ttcgacaacg aactcatcga aaaaagcttg ctcacagcga tgaattgaag tggtacaatg   120
actaccagca gtgggtgtac aagacgctgc tcccgaactg actaccgagg aaagagcttg   180
gctcaaagag aaaacttgac tatctaacca caaaaatggc attaatacag agtgttaggg   240
gctttcccct ataatcggcg aggatacctt cctcgccgaa aatgccacta ttgtggcgat   300
gtagtcatgg gcaaaggctg tagtgtgtgg ttcaatgccc gtatgcgagg cgatgtcaat   360
tccatt                                                               366
```


(2) INFORMATION FOR SEQ ID NO:195

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 626 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...626

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:195

```
aaacttttgt gcatcccnaa ggatgcggta taggttggtt tgttgccgca agcttgagga    60
attatttgtt ggcctttcga tatgtcgatt gccttttcaa gtattcaggt ggttataacg   120
ttggggatcc acctcttccc attccgacag agaagttaag cccaacggtg ccgatggtac   180
tgcgtcacag tgggaggtag gacgccgccg ttttttaaga agcgtgagag agaggggggg   240
ataggtctcc accctcctcc ccggaaaaaa aggtgaagga gagagtctcg aatcgaggct   300
ctctcctttt ttattttctc tctctccaaa aatcattttg ctttctctct attcctctat   360
atgctttctc cttttccttc ctttcctccc tttgtttccc ttcatcttcc tttccttttc   420
tcttttcatc ctcagtcgga ccagcaaagg ataatcggcc atttgctttc ctcccccttg   480
cttcgcgtta tcttataaag tgagttcgat ataagcgtta tggtgccgac tctcataaga   540
tttgtcgatc aatcctttgt tgggatatta actataaccg atcagaaatg aaagggaaaa   600
agtttgacgt ctcatcggat gtcgaa                                        626
```


(2) INFORMATION FOR SEQ ID NO:196

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 468 base pairs

```
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

   (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

   (iv) ANTI-SENSE: UNKNOWN

   (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

   (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...468

   (xi) SEQUENCE DESCRIPTION: SEQ ID NO:196
```

```
ggcaggtcga gatacgagtc ggggccggcc accacatcca cgtgatgttg cggatcaact    60
cctccttgac gcgctcggcc atgcagccca ataccccgta acgagacggg aagaagcccg   120
tcttttcttt cgtagcgagt ggtaatagcc agccggttca gcactttctg ctcggcattg   180
tcccgtaccg aacaggattg accaggatcg tatccgcctc atccacgttg tccgtgaggt   240
tgtagcgtcc atctgcatta cggacgctac cacctcactg tcggctacgt tcattggcag   300
ccataggtct cgatgtagag tttgcgctct tgtttattct cggggattta gagtccgtcc   360
gatttgttcg atcatgcttg tatgttatat caattgtcgt attatctcga ttattaccga   420
caaagtttg taaaactact tgtgctcatt atgtttgtga tggaaaag                 468
```

```
(2) INFORMATION FOR SEQ ID NO:197

        (i) SEQUENCE CHARACTERISTICS:
            (A) LENGTH: 2146 base pairs
            (B) TYPE: nucleic acid
            (C) STRANDEDNESS: double
            (D) TOPOLOGY: circular

   (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

   (iv) ANTI-SENSE: UNKNOWN

   (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

   (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...2146

   (xi) SEQUENCE DESCRIPTION: SEQ ID NO:197
```

```
ccactgacct ttcctctgtt caggaggcgt tcgatgagca tttcctcggt actttgcaga    60
ttcagcacta tgtccacctt ccatccatga tgtgcgagat cgtctccatg gcttctgctt   120
ggggaatggt acgtggaaat ccgtcgagat aatcccctcg gtatcgacca aagtgctgat   180
gagcttttcc atcatgccac gatcaggctg tcaggtacga ggtgtccctc gttgatgtag   240
ccggcgctgc ttggcccagt tcggtctgag ctttgatttc ggcacgaagc aacttccggt   300
tgaaatatgc cggaatccat atcgacggat cagttcttcg cttgggtgcc cttcccggaa   360
ccgggagcac cgaagattag tacgttaagc attattcttt tattttatag atgtcctggt   420
acatgcgtcc cagatcatca tgtcaaggcc gtgtcctacg ataaagtcat tgccgatctc   480
caagcctaca aatcggtatg gatatcgcat ttgagtgcag cgggtttggt cagcatagcg   540
ctatgcgcac ctctttggct ccaagctcgt agaaattctc ctttacgcac tcatcgtata   600
acccgaatca atcagatctt ctacgatgac cactgtctgc cacgcatgtc ggccgtcacg   660
ggcataatct ccttgagcac gaatgtctct gcataccgca ataactggag tagcgggcga   720
aatccacttg ataacctcat cgagagcctg catcagttcg gctgcaaaca taaacgagcc   780
gttctgatac agacgaatag gggattgtcc tcatgcagat cccgtttgat ctcgcagcca   840
tcctcttaat ggcttcatgt atgcgagtcg ccggaatgta aactcaaact ctttgtcttt   900
cagtttgatt gttctcattt gtcgcaatga cttctttatt gtgcgtgcaa atatagccat   960
```

```
tttgcatagg gcagctgcat gaaacgactc cgtattatat ataaggaggc gatcgtataa    1020
ggatgcgttg ggataatctc gcgaatccca tgttctgata gtttacgccc cgaattttta    1080
tatttctacc tcctaaaaac gtggcgtggg aaaatttttc ttttggtcga gaagtgaaaa    1140
aaacacgtgc cggaacgaaa aagttgcggt tccacttttc agaaaacacg tgccacagtc    1200
ggagcgtttc cggttcgtgt ttttagttgg caggttatga gcatgtgcct gcaagggtga    1260
tgtgcaatgt cgaagtaggt cggatcagat aaaaacagct gccacaagta ctacacttca    1320
cttgtttaat aagtcagaga cgggttcttt tctattgatc cctaatggta tatggcgact    1380
ttttctctgt ggagaggttc tcgggcggaa tggaaataac ctgaattttt ccgaaaagag    1440
tcggttgcat ggaaaagtct gtacctttgg agaattataa accaaaaatt ttgcaccaca    1500
tggctaacga taagacgcaa ccgtgcagat gctcaagcac gatttggact atttggaatt    1560
gctctcggga gtttcccgac agcgacggaa gcagctacgg agattatcaa tctcgaacta    1620
tattgaatct gcctaaagga acagaacact tcctggcgga cattcaggcg aatacgaagc    1680
ctttatccat gtgctcaaga atgcgtccgg tagtatcgga gaaaggtaga cgaggtcttc    1740
ggtggtcagt tgcgccaaaa tcagagcgag agctgtgcac cctgatctat tatcctcgcg    1800
agaaactcga actgtgaagc aaagtgatga gcggatggag gactggtata tggtcacgct    1860
gatcagctga tcaaagtgtg tcagaaagct gcagagaaat atactcgctc caggtacgta    1920
agacccttcc tcccaagtac agctatatca ttcaggagct ctccacgaag atggtgtcaa    1980
tcccaataaa tcggcttata tcagcagcac ttttcctcta taatatccac agggtgtgcc    2040
gatgacttta tcattgcctt agtgagacca tccagcggct ggtcatcgac catctgcacg    2100
ttggtaggga tgtctttcga ccgtggnccc ggagcacata tcatca               2146
```

(2) INFORMATION FOR SEQ ID NO:198

       (i) SEQUENCE CHARACTERISTICS:
            (A) LENGTH: 1129 base pairs
            (B) TYPE: nucleic acid
            (C) STRANDEDNESS: double
            (D) TOPOLOGY: circular

      (ii) MOLECULE TYPE: DNA (genomic)

     (iii) HYPOTHETICAL: NO

      (iv) ANTI-SENSE: UNKNOWN

      (vi) ORIGINAL SOURCE:
            (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

      (ix) FEATURE:
            (A) NAME/KEY: misc_feature
            (B) LOCATION 1...1129

      (xi) SEQUENCE DESCRIPTION: SEQ ID NO:198

```
ttttctcgaa ccggaaagaa atttttacgc tcgtaaacga aaattttttg cacgtgtttt      60
cgaattttta cgacccgcaa tttgatgatt tctggttctg tttgtttggc ggatcttcnc     120
cgttccgtcc gaaaaggatg ggtgcttgcc tgaggcgaga ggtcgcgtgt agtatggcac     180
atacacgatc gcttcaatgc tgaaagcaca cagcacgaga tctgccctac gacagcctca     240
aaagaagaaa cggggactaa tgggaacgat ccttctgtcg cgccgaagaa tgcgaagcag     300
attcaggaaa agatgaaagg aggggctcgc aagccatggg atgtcttgct tcggagggtg     360
tataaaagac gagatattct ccgtattcgg gacggccgaa agatcatcgg tcgggtgtag     420
caatagatcg gctacggcaa aagaataggg aatacatgga tgtgatgggg atcgtggcac     480
tcttcgcaga agaatatctg tgcttgagtc gaagttccgc accggacagg tagaaggttt     540
ggctacgcag gtcggttcgc tatgagtgtg ctctttgtcc gcaggggctt ctcatgacaa     600
tgttttgcca tgagacatgc catacctttg ttgtgatatg atggggcata ataccgatga     660
tcagcacgac aagggaggcc aagccttgaa gaatatggag agcttctttc tcacaagcga     720
tgcggttttg gaacaaaata agagttcctt cttatatcaa gtgttttttt gaccgatttc     780
cgtctaatcg cgaacttgtc tgaacgctgt acccagattg tcgataatat ccgtgctatc     840
agactctcct gactatagcg tccggcatag atgtctccgg ccaaccgtgg atataattgc     900
cgaggacaca ggctgaagca ggaagatagc cgaccccaat aggccggtaa tgatgcccat     960
gaggacatcg ccgcttcctc tgtcgccatg ccggggttgc ccgtattgtt gaatacgacc    1020
atgccgccgg catacaggtt gcactgaatg ctcctttcag gactacatag acatgatgtg    1080
acaggcgagg aatcgggctt ggcgcagccg ttcatagtcc gtattgcat                1129
```

(2) INFORMATION FOR SEQ ID NO:199

(i) SEQUENCE CHARACTERISTICS:
    (A) LENGTH: 1946 base pairs
    (B) TYPE: nucleic acid
    (C) STRANDEDNESS: double
    (D) TOPOLOGY: circular

(ii) MOLECULE TYPE: DNA (genomic)

(iii) HYPOTHETICAL: NO

(iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
    (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...1946

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:199

```
cattatcgtt acttatccag tcaataatca tatattgagt gggaatatct ttattttggc      60
agatcggatg gcctgaggaa aaattttatt cattaccttt tttccaacca cctgcatcgg     120
ccgtcattcg aaagttgaat tacatccttg tcagaaatcg ttgttatttg attgaaattc     180
ttttgttaag catttgaaat tagtcgttgg gactttgtcc aatgaagtgt tttgtattaa     240
ctctgccggc tgctcaatct taatcgtcga tatatatctt tttccatant ggaccattta     300
tgtcaacaga agcacatagt gagttctttt gatataagta gaatgcatca ttctttcttg     360
tctgctgggt ttattcttca acattatgtc atgatgatga ttagtagagg aacatccaac     420
tcaataaatt ttagaacatt cgattcatgc aatccattat gtttgtaaaa cctttttagtg     480
gtattttgtg attacatgcc caatcgctat tccagcttgc ctaataagct cgatagtcac     540
atgaaaggga ggtggtctaa ttcatggtca aaacaaaata cacaatcagc ttaggaaagg     600
caactaagta caaaaacttg caattttcat ctttttccca tcattattca agtaatttcg     660
ggaacttcct ttatttcaga aatcaaacat aatctttgtt cactttatga acaaaagcat     720
tttcaatttt cttgagttgt gtgcatcagc atcctntgca agtttgctga ggaagtctct     780
ttgatactac aattttccat atttgtaatt tattggtatg attgtactat gcaaggtatg     840
aaaatctatt aaagtcaatc ctctgaagcg tgaagaactt tgttttgtgc acatctatcc     900
tctaacatgc acttgtatat aattgtatat tgttgtttat gaatttctcg tagttgtgga     960
aaaaaattat tttttgagaa aattcttggc gatccgattc tttttcgaga cttttatatt    1020
agtatatatt actatattcg tttttgaaac gaaaaagcac atgcagattg aagtctttta    1080
caaactggat gatgggattt gaggatatga actttgagag agtttttatgc tcatgatgaa    1140
aggtttggtt ctaaatgttt tacaccctct tttttgaggg agggcttatt cgcaatctta    1200
aatttccgga gtttgtttag ttctcgacag agtacacatt caatattttt attacctttg    1260
aagcttattt agtctcaaaa ggaataatcc attataacta tgagtacaaa aaacacgaaa    1320
gaatggtcct tttagaggcg tttaagttgt tttcggaaaa accttacgac aagttactta    1380
tacaaacctc caggagaata ccggattaag cagaggcagc ggttgcatca tacaaaatca    1440
aagtctgctc tttttgcaac agtgttaagt agtttatact cgcaagttcc attcctgagc    1500
gttcttttga aaatggagaa gcctcaaagg ttttatacaa cgcttcatcg aaaattgtcg    1560
tatagagcaa agactttgca aaaaagagga attgagaaca taaataaatc tatgctcact    1620
tatgttctca aactttttac tactgcccaa ttatggcaga acgatagcag aatggatgaa    1680
aaaccagcaa aggacttggg ttaaaataat tagaatgcga tggataggaa agaaataaga    1740
agtgatgttg atgtggaaat ggttcatctt tatttcataa tctgtatttta ggattttctt    1800
tctccggtag cacgaaaggg ggggtacga cttaaatttt cttgaaaaag agttcggctt     1860
cattactcct ttctattaaa agaataaatt ctaaatccgg cgatcgttca agggagaaaa    1920
                                                                     1946
gtatcaggta tatcttctgt atctct
```

(2) INFORMATION FOR SEQ ID NO:200

(i) SEQUENCE CHARACTERISTICS:
    (A) LENGTH: 497 base pairs
    (B) TYPE: nucleic acid
    (C) STRANDEDNESS: double
    (D) TOPOLOGY: circular

(ii) MOLECULE TYPE: DNA (genomic)

(iii) HYPOTHETICAL: NO

(iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
    (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...497

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:200

```
atccggaatc tatcgaacag gccatgaagg ccaaggagct gatcgacaga ctacacccac      60
gccggcccga aagacttcta cagagaaaaa accgaataaa tcgaaatcga tcttcatgcc     120
ggcgaactac tcgaaacgac ggcagggtga agaatgggga tatattgcag taccaactgg     180
acaaattcca cgaagtatga aacaatacgc ctcctgtaag ggacaaaaga ttgtttttcat    240
tcatgcaaag gtgaaggcat attgcggcag gcaatagaaa aagaactgcg caccgctaca     300
aacaacatcg ttttcaggat gcctccttcc gagaatatgg tttggtgcta cgatggtgat     360
cattcattga aggatagtac cagttcctgc cgatggaaat agaaagaaaa ttcctggtct     420
taaatgacga tttcaaagcc aggctacggc ggtacacaac attatacaag cttatctcgt     480
ggctgatgaa gatgcac                                                    497
```

(2) INFORMATION FOR SEQ ID NO:201

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 1086 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

  (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...1086

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:201

```
aatttttatc aatcgaatta aaagtgtgtc cacttatttg tattaaattg gccttaactc      60
taaaaacaat gaactaggcc aatctttta cctcatttcc cataaatgga ggcaaagaga      120
gcttcttccc ttcgggatgt tcattgcttt tgatagaata atatatgtgt tagagatttc     180
caaggtctat gccacaatgt aattcgatca ttttatagat tgctcataaa aaaatattaa     240
gtgtaggaag ctgaaactta cagtaggcat atctttattt ttccttttca gtggattaca     300
tcgaaaagag agggtatgct tcatataacg agaggacaga tataagaagt ttgataaact     360
gttttcggca gtcaagtcct ctcaaaaggc aaacttcgag ataggagctt cggaagaacg     420
ctacaatgaa tcacctattt tatccttttg cccgaagagc cctcttcgga acgaaagaaa     480
acccttcggt taccactatg aattgagcga cacccaggc tcttacaaca tctctgtgaa      540
attgatggag tctctacgga cctactctct acaacttgag aagatagcgt atctgtattc     600
gatacgggtg tgggaacggt agcctacttt ctccgcacga taagcacacc tctttcgaag     660
acatactccg catcaatgac tcgggcgacg catctaccct gaatatatgg cgaaaggaga     720
cagattagcc gccaaaattc ttttcttgcc gaccgtatct atgggagttt aggagtgctg     780
gatttgacga cgacttccgt caattcgaag aggatatʹag tcatacgaat atcttctccc     840
ccccgaccat atccgtcagg tgttcgggtt accaaccaag atgatcgaac ggaagacgat     900
gggtgccaaa agttcgtgtt tcatcaagag acgaacggaa agacatcatc cgcatctccc     960
ccgttatgga tgataggatg tctttataac ctactaccat agccctatt atgccaaaaa     1020
gttgagaaga aaccgaaaaa ctttaggaga aagagagaat acaacatcta cgaagaggac    1080
gctttg                                                               1086
```

(2) INFORMATION FOR SEQ ID NO:202

(i) SEQUENCE CHARACTERISTICS:
    (A) LENGTH: 483 base pairs
    (B) TYPE: nucleic acid
    (C) STRANDEDNESS: double
    (D) TOPOLOGY: circular

(ii) MOLECULE TYPE: DNA (genomic)

(iii) HYPOTHETICAL: NO

(iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
    (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...483

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:202

```
gcacgtcggt cagcacctcc acgggagtat gcggattgag cgtgacgccg atttcatgcc      60
ggccttgcga atcgccgcca gtgagcgatg caggtgcgac tggcttcata gtggacgttc     120
atcatataaa cgcccagttc ggccaactgt ccacgaactt catcggctcc acgatcatca     180
ggtgaacatc gagcggttct tgcaaatcgg tcggatagcc tcgagaatgg gaaaaccgaa     240
cgaaaattgg ggacgaatac gccatccatg acgtcgatat gcagccagtc ggcccgctgc     300
gattgatcat ttcgacatcg tcggccagat gcangaagtc ggngacagca aagannggag     360
atacgatagg ttgcataagt atagtatcgg gttatttttt attgattcga tgctcgcaaa     420
gttatgcctt tcttgcgcga tccctgtaat tttcagacgg gctatcctat ggtttaccaa     480
aat                                                                   483
```

(2) INFORMATION FOR SEQ ID NO:203

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 2884 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...2884

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:203

```
gccttcttat ccgctcccgt tgcggcattg cgcgagtcgc cgccaatggg gcggagcgga      60
agactccctc tctcctaccc cttcttttcg agcattctat aaaggaaagg ggttcgacta     120
cagactattc acaagcaata aacttaagtg tttgccacag gtaacagccg atacatacac     180
aataaaccaa caatcaccaa gcaatgaaac gaatcgtttt atcatctttc ctgttcgttc     240
tgtcctactt tctttgatgg cacagaacaa taccctcgat gtacacatat ccggacgatc     300
aaggatgcct cctccggcga accagtgccc tatgccactg taacatccgg ctgacaggag     360
cagataccac acaggtgttc cgacaagtga ctacggcaac ggctacttcg tcataggcct     420
gccggcagct ccctcctatc actgacagct tcgttcgtag gtatgaaaac ccataccatg     480
cagattagtc gggaaatgga cagcacgaca tcaaatccat cgacatttct ctcgaatcca     540
ggacaaacaa ctctccaccg tcaccgtatc ggcagcacga ccactggtaa gatggagata     600
gaccgcctgt cctataatat gaaagatgac cccgcagcaa gacgaacaac ctgctcgaaa     660
tgctgcgcaa cgttcctttg gtaacgtgga tggtcagggc aatatccagg tgaaaggatc     720
ttccaacttc aaaatcacct caatggcagg ccctcgacca tggtgagcag caacccgaag     780
```

```
gaggctttcg ctccattcct gcccatacga tcaaacgggt ggaggtcatc accatccggg        840
tgtaaagtac gatgcggaag gcacaagtgc catcctggac atgtcacgga agaaggtaag        900
aagctggaag gatattcagg ttccatcacg gcagtgtcag caacaatccc acagccaacg        960
gtagtatctt tctgacggca agtccggcaa agtcgggctg actaccaact ataactacta       1020
cggtggcaaa acaagggctc tcgctacttt accgaacgta ctacatccat gctccaaaga       1080
tagaagaagg caaagggcaa gaaacctttg gcggacactt cggcaatccc tcctctcatt       1140
cgagatagat tcgctcaatc tctttacggt gggcggaatg tacgcctttg ggagatgacc       1200
accgaccgga acagcgtaga aaaaactttg ccggcagcaa cctcatgtcc tacatagaca       1260
gaaaactcaa aacaagatgg atgccggatc atacgagctc aatgccgact atcagcacag       1320
caccgcctgc cgggcgaatt gctcaccgtt tcctaccgct tcactcacaa tctaataata       1380
gcgagacctt cattgaccaa tggaagcgcg atccgctcaa ccagctaata cgatccagta       1440
cgccggccag cactccaaat ccgatgcggg atggacgaac atacggcaca agtggactat       1500
acacgtccct taggacaaga cattctttgg aagcagggct gaagtacatc tatcgtcatg       1560
ccacgagcat cctctctatg agatacgacc atccgaagat gctccgtggc agcccggtct       1620
ctatatgcac agaatccgtc gaacggaaag ttccgccacg atcaatcatc ggagcagcct       1680
atgccggcta caactatcgt aaggatcagt attcttgcaa accggcctcc gagtggaaag       1740
cagcaggctg aaagcactct ttccgaaaac gcagcagcag atttctccca caactcgttc       1800
gactgggtgc cacgctcacg ctcggctata ccccctcgcc catgaagcag cttaagctgg       1860
ccataacttc cgaatccaac gtcctgcaat cggccaactg aatccctacc gctacagacc       1920
aacgattatc aagtacagta tggtaatccc gacctaaagt ggagaagcgt caccacgtcg       1980
gtctctccta taatcaatac ggagccaagt catgcttaca gcatcgctcg actacgactt       2040
ctgcaacaac gccatccaaa ttacaccttc tccgacccgg ccaatcccaa tctgttccac       2100
cagaccttgg caatatcgga cgagagcatt ctttcagctt gaatacctat gccatgacac       2160
gccggccgta tgggtcagga ttatgctcaa cggaaatatc gatcgacatt ccaaaagagc       2220
gaagcactcg gcattgatgt caattcatgg tccgcatggt atactcaggc ctgatgttca       2280
ccctgccgaa ggattggact gtgatctctt cggaggttat tatcatgggg gaagaagcta       2340
ccagacgaag tagatggcaa tgtattcaac aatatcggta tagccaaaca gcttttcgac       2400
aaaaattgag agtctcgctg agcgcaaaca acattcatgc gaagtattcg catggaagag       2460
ccggaccatc ggcaatggat ttactatttta ttcggaaaag ccggtataca acggagtgtt       2520
tccctcagcc tcacctacag cttcggtaga tgaatacaca agtgcgcaag gtagagcgta       2580
cgatcgtcaa cgacgactca agcaaactc atcccaagga cagcagggtg gcggacaagg       2640
aaatccaccg gcaattgatc aagaaacact gtaaaaaaac accatacaat gagaaaaaga       2700
ttttcgccgg ccttgtcggt ctcataggca cagcactgat agccgtgcat gcaatatcaa       2760
attcgacaac aaaggcaaaa caatcacccc caaggcgatg ccatcacgga gactcgcaac       2820
atcggtacat tcgacaagat cgtgtcgagg atgcattcaa catccactac aaagccggta       2880
ttcc                                                                     2884
```

(2) INFORMATION FOR SEQ ID NO:204

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 562 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...562

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:204

```
ggacaaggtg gtggagaatc tgagcatctt cgttgctgca gctcgtttgg cggcgaggcc         60
ttggatcata cgctgctgca tggccctccg gggctgggaa gaccacgttg tcgaatatca        120
tagccaatga gcttggcgtg gggcttagat cacttccggt cccgtcctcg acaagccggg        180
tgatttggcc ggactctcac ttcgttggaa tccaacgatg tactttttcat agacgaaata       240
caccgctgag ccctgtagtg gaagaatatc tctactcggc catggaggac tacctataga        300
tataatgctg gacaagggac ccagcgcgcg ctccattcag atcatctctc ccccttcacc        360
cttgtgggag ctactacgcg cagcggtttg ctacggcacc ccttcgcgcc cgtttcggga        420
```

```
tcaatcttca tctggagtat tcgatgtgca tactattacc ggtatcgtgg agcggagtgc      480
acgcattctg aggtgtcctg ttcgcacgat gctgccgtag agatagcggg acgaagccgg      540
gtacgcctcg tatagccaat gc                                               562
```

(2) INFORMATION FOR SEQ ID NO:205

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 749 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...749

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:205

```
gctcgaatgt tcttgaatac ttgttcggtc tgctctgtta ctccgccggt acaaagttcc      60
ctgtggtagg atcaaggcct aattgtccgg aagcataggc atattaccca tcaggatagc     120
ctggctgtat ggtccgattg cggccgggca ttcttcgtgt tgattacctt tttcattacg     180
tactgttttt tatttgatta ttaatttgat gattgcagtc tttgctgtcg cactacttcg     240
taaatacaat gccggccgca acggagacgt tcaatgagcc tatagccccc atctcggaat     300
agctactatg ccatcggcca tcctaagcgt atcaggtgat ggccgacatc ctccgccccc     360
atgactatac ccaaaggcag cttcatgggt actcggtata tagatctgca gccttctccg     420
aagcagcgac tatgcgtata cgtattcttg caggctgcgg atggctccgg gaatggaagt     480
cacgcgacaa ccggaatacg atgcaaagct ccggcagagg tcttgatagc atctcctcca     540
ccgaaacgct tcctctttcg ggaatgatga tggcatctac ccctgcacct ccgccgtacg     600
agcaatagcc ccgaagttcc gcacatcggt gataccacga gtagcangag gaagggtgcc     660
ttaccctcct catagagcat cggcatagtt gatccaaacg ggtatattcg atagccgaaa     720
gaatggccac caccccttggt gattcttgg                                       749
```

(2) INFORMATION FOR SEQ ID NO:206

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 544 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...544

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:206

```
gagtattaaa atttctcgag agagccattt ttctagattc caatataatc cttatatcta      60
ttatactaga ttgggtagta cgatgaacca attggatccc aaaaaagaat gaggcaaaca     120
```

```
gaagatttcc tccgtatcga aaagtctgga aggaatggtt caacctagat tctccagagc     180
ctaatagcta tgatatctca tgctaagaac agggaccaat atgctccatc gtaacctgct     240
gaacttgtaa gaaactcaaa cttctcgata tctaccaagc tcaagctgta tgctagtaca     300
gaaaaaaggg tgtattttcc tggtttttata acggatatag aaggatccct atgtagggtg     360
cacttctgtg agagtctttt ggaatacaat agaccgttct tatatcttat tttctttgtt     420
ctccattgtg gaagagatct gaagaagatt aagaaaatag gcaattaaga atgtaaacct     480
tatngagagt gtctatgcag cagatattat taggggggag tggangtata tccctttact     540
cagc                                                                  544
```

(2) INFORMATION FOR SEQ ID NO:207

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 450 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...450

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:207

```
tgttgcgtta gaaaatggaa agtgcagata tggacggctt gactagggga tagctttttg     60
tctatgtagt ataagataat tcctctgtat tctgcgaatt atgacccttg tcttttgcct     120
cgtatcttgc tttcagcctt ttcaataccc ttggctatag tcttcttttt tgatgatttc     180
tagcaaacct tctagacaag tttccgattc tccttgagag aaaggcaatt caaattaagc     240
gtgattttat atcatcattc caagacttat ttgcactaga tattgttccg tcatcttgta     300
gctgatgcta agaaacagtg cgtcggtaaa gagattaagt gtatctcctc atccttcttg     360
gagcaatcgc aatgagcgga gccctgactc tgccactgca acatgcaacc atattgctat     420
aggatagttg ctgggcaggg ttttggctac                                      450
```

(2) INFORMATION FOR SEQ ID NO:208

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 1336 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...1336

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:208

```
ggccatgccc cactgccacg cgtgcatcgg ggacttcacg ttgtactatc cggcgatctc     60
ttctatatta tctattcggt tgtggacgat aaagaccttc cgttgcggga catctcgaaa     120
```

```
ttgacagctt cccgaacaat gtcggggtga atcgtgccag ttcggtggca acgggatagc      180
gattcggcgg tggggtttga tattcgagag gtcgcgtgct cccatcagag agaattgcaa      240
agtacgggga taggtgtagc agacatggtc agcgtatcga cattgacctg tagttgcgca      300
gcttttcttt tactgccaca ccgaatttct gttcttcatc gatacaagga ggccgaggtc      360
atggaatctg atatcgttgc tcacgagcct gtcgtaccta taattatatc gatccgacct      420
tctgccagat cgtgcagaat cctttaatat ccttggccga acgggcgcgg gatatgtatt      480
cgatacgcac gggaaatttt gcaatctgtc cctgaacgtc tgatagtgct gataggccat      540
acggtagtcg gcaccagtat cgctacctgt ttgccgtctg tggcggcttg aatgcggcac      600
gaacagccac ttccgtcttg ccgaaaccga catcgcccag ataagccgat ccatcggacg      660
atcgctttcc atatcggctt ttaccttgcc gtggcacgct cctgatcggg cgtatcttcg      720
tacaggaaag aggctccaat tcgtgctgta ggtagctgtc cggactgaat gcaaagcctc      780
gctctctttc ctttgggcat agagccggat cagatcgcga gcaatatcct tgaacgcttt      840
ttggtcctct ctttgagctt ttgccaggct cccgtcccga gagactcagt tctacctgcg      900
catcactgtc accacctttg tatttggaca attatggagg ctgtgcagat tgacgaatat      960
tatatcgtta tttcggtaaa gagtttgatt acttcctgcc gcttccctcc cacatcggtc     1020
gtgataaggc tccgaaccgg ccgataccgt gatcgatatg cacgatatag tcgccttgga     1080
gaattggttc agctccttca gtgagagggt cactttcccc gaacgggttt gtcgcttttg     1140
agattgtatt tgtggtaacg atcgaaaagc tggtgaccgt aagcagaccg atccgaagag     1200
cttcgtccga aaaaccctca tgtaagtgag cgatactctt ttcggaagga gcgaagagct     1260
tccacgctcg gaaagatctc ttccactctc tcgtattgct tatccgaggc tgtggccaaa     1320
agcttctgta gccggc                                                     1336
```

(2) INFORMATION FOR SEQ ID NO:209

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 2123 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...2123

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:209

```
gggtggtcct gcctgtagac caattctttt tttttgccca atatgtaatt ctcatggcca       60
aaaaatgtct tcaaagactt ctgatcaaag aaggatttat gatttgggaa agtgtaaacc      120
gatctgagcc actcggtagg actatcccca cggtttattt ttaactttgt tcggaaatag      180
cctctgaaaa aacgaaggat attgtaagta tggccgataa agctcttgta gtggagatga      240
gagattgacg ctctgtcagg aggaaaacgt catttttcaa aatttgaatc tgacctttcc      300
gccggagact tcgtctatct gataggctca gtgggatcgg ggagagcact ttgctgaagg      360
ctttgtatgc tgaggtgcct atctctgccg gtatgcccgc gtgatagatt atgatctggc      420
aaagttgaaa cggaagcagt tccctatctg cgcaggaatt tgggcattgt gtttcaggat      480
ttccagttgc gaacggacgt actgttgcgg agaatttgga tttcgttttg cgagctacga      540
ctggaaaaac cgagccgatc gcgagcagcg tatcgaggag gttttgaccg tgtgggaatg      600
tctcggaagg cttataagag accgcacgaa ctgtccgagg ggagcaacaa cgtgtgggta      660
tagccagagc tttgctgcg aagcctcgtt gatcctggcc gacgaaccca caggcaacct      720
cgattcggtg accggttgca gatcgcttct ctgctctacg aaatcagtaa gcagggcact      780
gcagacttat gagcacgcac aacagcagcc tgctgtcgca tctgccggca cggcattggc      840
cgttcgtaag aatggcgatg cctcctcttt ggtcgagctt gatgcagatg ctgtttcaag      900
aaaaaatacg gaaatagatt agcacgataa gtcaggaatt gaaagttctc aaatttggcg      960
gtacgtctgt aggagatgct aagcgtatcc gcaagtgttg cccgactgat tactttcggt     1020
aaaaggaaga aaattatagt cctttcggct atggccggaa cgaccaattc gcttgtcgaa     1080
tagcctcaca ccttgtcaaa cgcaatgtgg cacaggccaa agaggtgtgc aggtgttgcg     1140
agagaaatat catcgcgaaa taaatgctct atacaacgtc cggatacctt gagcgcagcc     1200
aagaaggccg tcgactccct cctcgctctc tgggtcatat gtgcgacgtg gagggcttca     1260
cactcttcga ggaaagcgtg tgttgatcct cggcgagctg atgagcacga ccatgatgca     1320
```

```
gattatttgc aggagatggg tgcagtggta gccatgctgc cggctttgga gttatgcgta   1380
ccgacaagaa tgcagagccg gacaaagact atatccggaa gatctcttgc cgatgataga   1440
ggctcatccg gatgaggata tgctattcct acggagggtt acatttgtcg gaatgccttc   1500
ggagagatcg acaatctcca cgtggcggca gcgactacac ggcctctctg atcggagcag   1560
cactgaatct gatgaaattc agatatggac ggatatcgac ggcatgcaca acaatgacct   1620
cgtgtcgtag acgttacggc acccgttcgc cgtctccatt ttgaagagct gcggaactgg   1680
cacacttcgg agccaaaatc ctccatccga cctgttcaag ccggccaagg agaagaatat   1740
tccggtacgt ttactcaata cgatgatccc gatgcacccg ggacgctgat ttcactggat   1800
accgaaaagg atttatcaag gccgttgctg ccaaggatgg cattacggtt atcaaggtaa   1860
aggcagcaac aaactccttt catggcactt tatgcgcaag ctcttcgaga tttcgagttc   1920
taccaggagc ctgtggatat ggtcgctacg agcgaagtgg tgtttccctg accattgaca   1980
atgacaagaa tctgcccgat attgttcgtc cttgtccgat attggagatg tgacggtcga   2040
taaggatatg gtcatcattg tatcgtaggc gatatggagt gggacaatgt gggcttcgag   2100
gctcgtacat caatgcgctg ggt                                            2123
```

(2) INFORMATION FOR SEQ ID NO:210

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 860 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...860

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:210

```
gggaaatgaa tcgcttgggg gttatggtgg atatatcgca tgcggctgtt cgactgttcg    60
tgatgtcttg caaatcagta gtgccctgt tgtagccatc attcatcgtc ccgcgctctg   120
tgtaatcata cacgaaatct gaccgacaag acgcccttgc catagcccgt agtgggggag   180
tggtgcaggt ttgtcttatg ccggatttat ttccgagcag gaggaagagg gctccgtaca   240
gcatgggcag accatatcga ccactttgtc aggttgttgg gcatcgaaca tgtagtgtcg   300
gttccgattt tgatggagat ggcgaactgg taggttgccg agggccaatg acctgatcaa   360
tttgactgtg gagcttctac gtcgtggcta tatcgggatc agctcggatt gctctggggc   420
gagaatttcc ttcgggtgat gagaatgtac agcagaaagc aaagtgtcag tagaaacagg   480
ttttcaaggt tttcggttgc caaagatccg attttggtgg acaattattt gcaaatgtga   540
aataacctct atctttgcgt cgtggttttt tcataatagt attagattta aggttaacaa   600
gaagatcgaa ggctgtcggg agacattctt tagattggag atcccggcct gtacttatcg   660
tgcagggcgg gttttttgttt tgtaccctcc ggcgtggtca gcgaagaagt cgagaatgtc   720
gattaattct tccaactgag actgttgcag gggatttttca ttgagctctt ttgctgcaga   780
gctgttctta gtgcctttgg gaaagatcaa acctccggta tatggacatc gagaaacaga   840
aattttccca agtttccatt                                                860
```

(2) INFORMATION FOR SEQ ID NO:211

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 2606 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

(iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
    (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...2606

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:211

```
aaaggatgta atattgtgag cccgcaaaaa gaggggaatc catcagactt aatatcccgc    60
ctctctttct ttgcggaaaa gggttcaaac ctgatttcta aagcattaca taatgataac   120
tcctcaacta atcgaaccgt gtactatgcg gtgatcggtg cgtcgcaaga tgtgacaaaa   180
cccggtggaa aagtatacaa aacattctga acggctcgtt tcagggtcgt gtattgggtg   240
taaatcgaaa gtgtctaacg tacagggagt ggaatgtgtg cccgatgtga aagactaccc   300
caagtagatt tggctatttt ggctattcct gcacgtttct gccacctacg atcgaggtgt   360
tggtgaaaga aaaagggacc aaaggaatca tctattctct gcagggttct ccgaaatggg   420
tgcagaaggc aaggctctcg acggcaaatg gccgaactgg ccaatgaagc cggagctacc   480
ctgatcggcc caactgcgtc ggcgtaatga atccgctgca ccaatcggta tttaccactc   540
ggtgccggta cttacgccta agggatgcga ctttatctcc ggttcggggc aactgctgta   600
tttatcatgg agtcggctct gagcaagggg ctttcttctc atcggtatat tcggtcggca   660
acgctgctca aacgggtgtg gaagattgct cgaacatttg gacgagacat tcgatgctgc   720
cacttcttct catacctgct cctatatata gagactatct ccaaaccgaa acgcttcctg   780
aaactgccag atcattggta cagaaaggct gtcgcattgc ggccatcaaa tcaggacgtc   840
ttcagacggg ggacgtgctg cagcttcgca cacaggtgcc atctcaactc cgatgtggct   900
gtagatgcac tcttccgcaa agccggtgta ggcgctgcta cagccgtgaa gaactggcta   960
ccgtgggtgc cgtacttcaa atccggtact caccggtaag aatatggctg tgatcacaca  1020
tgcaggcggc cggccgttat gctgacggat gctctctcca atggaggtat gtccgtactc  1080
cgattcccga agaaaagact cgcacattgc tgtcggagtt gtttgacgtt cttccgtggc  1140
taacccgatc gacattctcg ctacgggaac agcagacaat tatcgaaagt gatcgatact  1200
tgcgagaaag atctggacac gatagcggta tggtcgtgat tttcggtagc cccggactct  1260
tcgatgtgag cgatcttacg atgtgatacg cgaacaacag aaaaaatgca agaagccgat  1320
ctagccgtac taccttctgt gatcaacgcg aaggaaggaa tggagcgttt catgctcagg  1380
gaggcatcct ctttgaagag gaagtggctt tggcacgtgc ttctgcaagg tctaccaaac  1440
gcccaagccc gaaatgactg aagagagcga ttgcccaaag cagcagaaat ccgccgtctg  1500
ctcgccggca agagcggtag ctcggaaccg gcgatatgct ccagctgttg gatttgaccg  1560
gtatcactgc ccgcaagaac gtctggtgac aacagagaca gaagctctgg atgcagccgt  1620
agtatcggtt tcccattggc tatgaaggta atgggactgg cgcacaatcc gatgccggag  1680
gtgtaatact gaacgtttcg accgaagaag gcgtaaagag agctttggca agctgatgca  1740
aatcaagggt gctgaagggg tacagtgtca cagatggaga gtggcgtgga agtcttcatc  1800
ggggtaaaga aaggggcgaa ttcggtcatc tgattacctg cggtttgggc ggtatattcg  1860
tgaagtgatg aaagatattc gctgtgctct ggctcctctc ggcaaaaacg agcactggaa  1920
atgatccgtt cgctcaagtc ctatccgatc attcgcggta tcgcggcaaa cagggcatca  1980
acgacgaggt aatcgccgat acgctctgta gatctcccgt ttgctggctg cagtgcccga  2040
gatcgaggag atggacataa tccgctgatg ggacgtggag aaagactatc ggccgtagac  2100
gtggtagtcg tctgagcgat gcgaagtaag agatataaga aattcaagaa cacagtaaaa  2160
atatcaagag atgaattttc caatcgatga aaaactgatt cgtgaaagca aaacgaactg  2220
cacatcaaag acctcggcat ggcttcgatc cgagtctggt agctttggtg accaatctgg  2280
aaaaggctac cggcactaaa ttcgccgtat ggaaatgggt gtgcccggac ttcctgcacc  2340
tcagatcggt atgagacgga gatacaaaag ctacgcgaag gagtagcttc gatttatccc  2400
atttggatgg tctgcccgaa ctcaagcagg aggcatcgcg ctttgccaaa tctttgtcaa  2460
tatcgacata ccggcacgtg cttgcgtgcc tacggtaggt cgatgcaggg atgcttcgta  2520
tctttcctcg tggccaatcg cacacacaaa accgtgaata cggtacgctc ttttatcgac  2580
cccgggttca aatctgacaa gctaca                                       2606
```

(2) INFORMATION FOR SEQ ID NO:212

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 636 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

```
    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
          (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
          (A) NAME/KEY: misc_feature
          (B) LOCATION 1...636

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:212
```

```
gcggcttgtt cagtagcttc ttcagccttc attgcagcag aatcgatctc atagcagccg      60
tatcaactac aggagctgca tcttctacca aagtggcaaa tccatagccg tagagtcagc     120
agcttcttca gtcttagcct gagagttcaa gaagcgaatg atacagctgc gattacagct     180
gcaaaagcaa caaattcttc atttcctttt ggggttaaaa gtgtaattaa tgttctataa     240
cggcgaaata tacagtttct tttggtacca ccaaaaaaaa cgaccaaatg ctgttgcatt     300
gagccctttt atccggaagc cttacgcatg gctattcctt ttaagacggg ggcacccgat     360
cttgcgcaat caagtataga ggaaacgttt gagctgtgtt tgggtgtctt ctcgaactct     420
tcgtcatggc ggacaaaggc cttattttct cgtatgcacc cacttgcccg ttcagttcgg     480
ctcggctcct tcgatataag cccatgcctg atccggagag atccctttat gctctatcgc     540
tgtctgtccg gcacgattag tgcgatcaag cgtccgtctc gctctgtgcg atactttcga     600
ggacatagga taattgttga tcttcgatcc tattcc                               636
```

```
(2) INFORMATION FOR SEQ ID NO:213

    (i) SEQUENCE CHARACTERISTICS:
          (A) LENGTH: 1063 base pairs
          (B) TYPE: nucleic acid
          (C) STRANDEDNESS: double
          (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
          (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
          (A) NAME/KEY: misc_feature
          (B) LOCATION 1...1063

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:213
```

```
gcagaaaggt tggcttatcg gtgggcagca aaacgtatca ccttctgtca ctcggagagc      60
aattcattcg agatcaagat gacgctcgaa ccgattcaga actgcgcatc aacctcacag     120
ccaacagaac cgatacccga caaacgcgac ccaatacgtc tatgccggca tgccacgtac     180
ttatggagga aatttctgat gacgaccatc ggactgaaag gcatgttcag cagttcgtcc     240
ggagcacggg ctatgcctcg caagccttca atcagttcct ccacaatcgg gagaaatcgc     300
agggcgtatt atggctcaat atcatggagc cactatccc tctccggatt catggaagga     360
agcagtctgg gccggccagc cggtttctct ggaaccagtg ccgtttctct caactcagcc     420
gacgtgctta ttccggcttt ctcagtgctt atactcagag gtcagtggga aaaatcggcc     480
tgtccggcat cccctcatgg ccttccattc ttcccaactg gaatgtcaga aacacagccc     540
aagcaaaaca gaaaaaccca acaaataaag aaagaatgcc cgaatcaaca agcaaacagc     600
cttaccgcgg tatatacaac gtagatagct atagctctac ctcggttggg tgggcttgac     660
cgatggtagc aacctgggct ttatccagac ccgtcggacc ccagtacgct gactcccgtt     720
gcatccatgc cattcacatt ccgtttgttc gtctcgaaga cagtttttgct cccctgctcg     780
gtgtgaagtt acgtttatga gtggattggg aatcaatacg gactacagaa agatcgccgt     840
ctgaatctga atctatcggc ttatcagctc gtggagtcga ataagatcag ataaccgtag     900
ggatgagcta taaggcagag aattttgcca actcatcggc ctgcaacgga caagacccac     960
gaggaaggca aaaggagggc aaagaacaac gaagaccatg gcttcgcgta ccggtggggc    1020
actgactctc gagtggacta tgcttacaag ccgacactga cgc                      1063
```

(2) INFORMATION FOR SEQ ID NO:214

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 1200 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

   (ii) MOLECULE TYPE: DNA (genomic)

  (iii) HYPOTHETICAL: NO

   (iv) ANTI-SENSE: UNKNOWN

   (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

   (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...1200

   (xi) SEQUENCE DESCRIPTION: SEQ ID NO:214

```
ggcgagtcag tacttcgcga ataacgacca agcctatccc ctgaccattg gcttggtgct     60
gaagaatggt gtaaagagac gggtggcaac gtcatcgcga taggctgtcc attatcctct    120
acgagcagat tgtgacgatc caaacaggca gaaccgtctt tgttgccgag acagccagat    180
cattttgctg tgcaaactct ctatagcgtt gcgcagcaga ttgatcacca cctgctctat    240
ttgcttgcat cgcagcggac taagcacgaa tcttgctctt tgcacatctt catttcacac    300
ccgtttcgac agccaaaggc tgcatcagca gtatgcatcg ctccatagcg gtaccaagtc    360
tacggaagat agggtaggat caggtagctt gacacttcgg caaatcgtgt gataaagcga    420
cttcaatggc catacaccgg tgcggcagag agcgatggct tcggacactt ccccttcggg    480
agtatgagga tgtcgtcgaa agcatccccc acggcattta gcacaccgat tataccggcg    540
tactgttatt gacctcatgg gctatcagcc tgatcagttt ttcataggtt ctttctccgc    600
cgaatgcaac tcctcggtca gggtttcgat actgaaaaga gacggctgaa cgaacgatcg    660
aagaatctca tccgcgtaat cctcctacct cggccgtagg caatcgccat gtacgggatt    720
cccttcgcc cagctgtccg gaccgaaagg gatcttcgcg catacttctt ccaacggtct    780
ttcgtcggga tataatcatc gggtaagtcc aacagcctgc gtgcggcagg attaccgata    840
caacccgcat gtcgaaatcc aaaacgacga agcccacggg cgaacatcca tcacgagcga    900
aaggaaattg tccctttcct ccagtctcag ttctccttct taaggctgtg catcagcgca    960
ttataaagtt cgaccacccg tctgcatccg gctgaccgac aggagcaagg gtagtggcat   1020
agtcctgtga cggagcatat ccattccatc gcctacggct cgtatcggca atactaccta   1080
ttatatagga aaccgagaaa gaagaggaga gcaacctcta tagccagatg aagaagagcc   1140
cgcctttctc taccggagga tataggagag tcatcgcata agcaatagag agagcaatac   1200
```

(2) INFORMATION FOR SEQ ID NO:215

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 3053 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

   (ii) MOLECULE TYPE: DNA (genomic)

  (iii) HYPOTHETICAL: NO

   (iv) ANTI-SENSE: UNKNOWN

   (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

   (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...3053

   (xi) SEQUENCE DESCRIPTION: SEQ ID NO:215

```
cagcgggggat gctgatgggc aacttaccaa ttcttgacat aattccgtac tcctttatca      60
ataaacgtaa cacaatactt ctcccccaac tttcaactac gagcttcttt atcagtcatc      120
actcctcgtg gggtagaaac aatagcatac caaggccgtt caatacgcgg ggcatatcac      180
gataacccac atacttcgaa ggccgggacg agacacacgt ttcaactttc tggatggcat      240
ttacttatgt gccaaatcat actttaaggc aactttattt atgccttgag agtcttctcc      300
tcgaacttat agttcaggat ataccctttg tcgaaaagga tcttgtgatc tctttcttaa      360
tatttgacgc cggcacactt accacacgat ggcagccata attgcattac gcaaccgcgt      420
caaataatct gcaataggat cgtcattttg aattacaatt aaattgatcc ggaaagccgg      480
acaatattta aactcttacc aactcgcttt ttttacgccg gggataagac cggcagaagc      540
atttcacgaa attgaatacg ggaaatacca aattggcgca tatagccctt ggacgcccag      600
tcatcgagca acgattatgc aaacgaacag gagaagcttc ttagggagca actgcaaggc      660
ttcataattt ccttcagcct tgagtgcgct ctctttgcag catatttcgc cacaagcttg      720
gcacgcttca cctcggggct ttcattgatt ctttagccat atcaattttg ttttttagcg      780
ttctgaacgg taaaccgaat tctttcagaa gggcataacc ttcttcatcg gatgcgccga      840
agtcacaaag gtaatattca ttccgagaat cttcgtaatc gctcgatatt tatctcgggg      900
aaaatgattt gttcattgat tcccaacgta tgttacctct tccatcaagc ttgctttcga      960
tacccttaaa gtcgcggatt gaggcaaagc gatgcgcacc agacgttcca agaactcata     1020
catttgctcc gacgcagagt aaccataaca ccgattggca tcttctttct caacttaagt     1080
ttgagatgtc tttcttagat accgtcggta cagctttctg tccggtatag ccgtcaattc     1140
gcttactgca acatcgataa tcttcttgtc accggtgcca taccaagacc ttggttgatc     1200
acgattttct tcaacacagg gacttcatca cgctcgtata accgaattgt ttcatcaggg     1260
caggaacgat tcttcctgat agtctttctt cagattggca gtggcactca ttatttaatc     1320
tccctcctga tttttagcg taacgaacta atttgccatt ctcattgaga cgcggccaat     1380
gcgagttgcc tttcctgttt tgggatcgac aacattcagg tggaaatatg tataggagct     1440
tcctttgata tgattccacc ctgaggattc tggcgctagg cttagcatgc tttttgatca     1500
tattcagccc ttcaacgatg cacgctgttc ctttactaat acctccaaaa cgcgaccgga     1560
gtggccctgt cttcgccact gatcaccatg acggtatcac ctttctttat atgtaattac     1620
tcatttctgc ttgcttaatt ataaagttat aatacttcgg gagcgaagaa acaattttca     1680
tatttgttcc acgcagttcg cgtgcgaccg gtccgagata cggctgccac gaatatcacc     1740
ggctgcattc agcaagacac aagcttgtcg tcaaaacgga tatacgatcc atcgggacga     1800
cgaacttctt tctcgtacgt acgattacag ctttggagac agcacctttc ttgatatcgc     1860
ttaagggata acactcttga ccgaaaccac gatgatatca cccacagagg ctaacgtctg     1920
cgcgtgccgc ccaaaacacg aatacagaga gcttcttttg tccgctgttg tcagcgacaa     1980
cgagtcttga ttcttgttgt atcatcttat ttgccctttc gattatttca gttagtctcc     2040
atctctttgt acgactcaag gacgcgtctc catgatacgt accgtatcac cgataccgca     2100
ttcattctct cgtcatgtgc gtggtatttt tttgtcttat tgacaaactt accataatag     2160
gatgcttctc tttccacttc acagcaaccg tgatagtctt atccatttgt tgcttgagac     2220
aacacccaca cgttcttttc taagatttct ttcctgtgtg cactctattt atttattgag     2280
ttcgcgttgg cgcagcactg tctcatctgc gcaatcatac gacgttgatg ctttagttta     2340
gcaggactat ccaaggcgaa accgcatggt tgattcgcat ttggtcataa gcagccactt     2400
cgcatccaat cgctcctgga gctcttttgt tgcaagctct ttaatttcgg aatcttcatg     2460
acaattacgc attttgattt tggatatcat aatcgtgaca accacgaact tagtcgttac     2520
ggggagcttc tgagcagcca aacgaagact tccttagcta tttcgtaagg cacaccttcc     2580
acttcgaaaa tgattcgccg ggagtaatag gagcaacgaa accttccgga gcacccttac     2640
ctttaccata cggacacctt ctcccttctt ggtaataggc ttgtcaggga aaatagaacc     2700
catacttgtc cttgacgctg catatagcga gtcactgcaa tacggcggcc tcaatctgac     2760
gaccggttat ccacttgctc tgcaaagact tgatccaaaa gaaccgaaag acaactggtt     2820
acctctctgg gcaaaaccct tctgcgacct ttctgctgtc ttctaaactt tgtttttttt     2880
ggttgtaaca tttgtctgtc tttctaaatg ttagcgatta ccttttcttc tacggttgcg     2940
tcaccgccac ggttgttgcc gccctgtgca ttgggacgac ggctttggtt ttggccactg     3000
caaaattggg ggcgaggtcg cgtttctcgt aaacctccct ttgcaaatcc aaa           3053
```

(2) INFORMATION FOR SEQ ID NO:216

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 1343 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
    (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...1343

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:216

```
gcggacattt ttacgcggtt tttcaaagcc aaaaagacaa taactccaaa taataaagaa    60
gaaaatgaac gtatcgatca agaatacgga tgccgtcatg ccattgctac ggtagcaatc   120
gagaaggctg attatgccaa cgaagtgaaa aagctctgcg tacctatcgc caacgtgcca   180
atgtccccgg attccgaagg ggatggtacc gatgggtatg atcaagaaaa tgtacggtaa   240
gggtgcaaag cagaggagat caaccgcgta gtcggtcgtg aactctatcg ttattagcag   300
agaacaaact caatgtactg ggagagccta tgcctaacga ggattgcaga aggagtacga   360
cttcgatacc actgacgact ttgaattcgt atcgacctgg ctctcagccc cgtggtggac   420
gtagtggtag acaagagcat tgtgtacctt attatacgat ccaacccaca gaggagatga   480
tcgaccggca atcgaatcta tgagatccag ctacggacat tcggtggaag ccgatgaagg   540
actgccaacg atgtagtgaa ggggcgtctt tgcgaattgg aggatggcaa cccaaagaag   600
gtggtatctg tgtggaagaa gccatgttgc ttccggctat atgaaggacg aagaggagaa   660
gaataaattc gtcggcgctg ccaagacagc gttgtcgtat tcaatccctc gaaggcatac   720
aataataatg agtacaactt tcctccctcc tgaaagtgga caagtcggct atcggagagc   780
atacggtgac ttttctttcg aaatcagcag tatctcccga catgaaaagg ctgactgaat   840
gaagagttct tcaaacaggc tttcggcgag gagacggata tcaaaacgaa gcggacttgc   900
gtgttaaggt aaccgaaggt gttcgcgagc attcacggcc gaaagcgact acaaatttct   960
catcgatctg cgccgcgaat ggaagctcag gtaggagagt tgcagttccc cgatgccctg  1020
ctgaagcgcg gctgaaactg tcgcacacgg agtggagtga tgaagaactg gaaaagcata  1080
ccctgccatg atcaaggatc tgactttcca tgtgatcaag gaagatcggt gaagaagaac  1140
gacatcgtgg ttacgccgca agaggtcagg aatttcccat cattgtagcc aagaatcagt  1200
ttgctcagta tggcatgtcc gccgtcctca ngatgctctc gaacgctatg ccaatacgat  1260
gatggagaag gaagtgctcg tcgcaatttc ttcgaccgtg ttacggaaaa taagctggct  1320
tgcgcgttga aagaaaagct cga                                          1343
```

(2) INFORMATION FOR SEQ ID NO:217

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 521 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...521

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:217

```
ggcgtgaagt acagcgatat taaccaactc ggcaacgaag cagagcgcgt gccctcaaag    60
agagctatag ccacctggct aagctgcgcg acgaagtgtc gccatgggca tcattcccgc   120
gatcgctgac tggaagacgg tgaatccaac ctctaacagc agttcttcgc aaataatact   180
cttgagagag ggggagatcc gaatgataag ttttcggtgt tccttctctt tcttatttcc   240
cgtccttttg cttttgtgt ttatccgcca catttgtcag ccggtagaga tgaccgattt   300
cggcagcatg taaacgggca aaaagagaaa agtcgtatcc tccttcgcat tcggacataa   360
agaaaaagcc gaaaccctct tgcatcgaag aagtttcggc ttttcggccg gaggcaaacg   420
actatcaaag actattccag gaggagcaaa ctatctccat aagtccgtgt ccactgncct   480
attgagaaag cttactcgtc aggcgtgccg aatttcggcc g                       521
```

(2) INFORMATION FOR SEQ ID NO:218

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 446 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

   (ii) MOLECULE TYPE: DNA (genomic)

  (iii) HYPOTHETICAL: NO

   (iv) ANTI-SENSE: UNKNOWN

   (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

   (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...446

   (xi) SEQUENCE DESCRIPTION: SEQ ID NO:218

```
ctgaaaaatt tcattcgctc agtttacaac caaagcaatg cgaagaggat ttagatggca      60
aactgggata cgtgctactg atcggaaaac cattgagcaa tatttggctg acactgataa     120
tacaaaagtc ccaacctctt ttattcaaat gtctccttaa ttccaagtca tccaactttt     180
ggttccatat gcgcctcgac tattttttta gttgtgtttc gcccccttgat actgtcggcg    240
atttgttatc ggtcgattta gcngtcacca atgctcatga attgcacaat ctgatgaaaa     300
gactatcaac aaagaaatct catataatcc tattgcacac aaaatattct ttacgcagaa     360
nggaaaggct gcgatgctcc aatcttacgt gtttcttaaa aagaaatcgc cttctggtta     420
cacagtcaac tctatcttaa atctaa                                          446
```


(2) INFORMATION FOR SEQ ID NO:219

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 430 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

   (ii) MOLECULE TYPE: DNA (genomic)

  (iii) HYPOTHETICAL: NO

   (iv) ANTI-SENSE: UNKNOWN

   (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

   (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...430

   (xi) SEQUENCE DESCRIPTION: SEQ ID NO:219

```
gctttcatct tcatggcttt ccatgtagag atggccggag ctgcgatcaa gcaatgacag      60
caggacgcaa tcctcggaaa atggctgcaa tgattttgtg tccctcatct gcgcaaagaa     120
catggctaca gccagaatga tcaggaagag ggaagaatag tccccaaggc gcaaacggct     180
gctccggcat atcctcgagg cgatagccta cgaagatgga tatattgacg gcaaatactc     240
cgggcgggat tgcgcaacgg caaaaagatc cagaaaatcc tcctccgata gccatggtgg     300
ttatccacta tatcggcctt gatcagtggc aacatggcat aacttcaccc gaaggtgaat     360
cccgccgata ccggaaaaag gtgagaaaga aggatagata tggatttcac ggcaaaaaaa     420
gaagaccact                                                            430
```


(2) INFORMATION FOR SEQ ID NO:220

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 615 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

   (ii) MOLECULE TYPE: DNA (genomic)

  (iii) HYPOTHETICAL: NO

   (iv) ANTI-SENSE: UNKNOWN

   (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

   (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...615

   (xi) SEQUENCE DESCRIPTION: SEQ ID NO:220

```
gcccgaaata cggaaaatca aacaaaatgt ttcactaaca aaaaagataa cgaacatgaa     60
aagattatta ctctctgctg ctatcctaag tagtatggtt tgtttaatgt caatgcacaa    120
gagttgaaaa cctctgctga catgaaagtt cttttaagaa gaatgtggta ttggaggtat    180
ttactgccga atggtgggtt actgtccagg tggaaaagag cgcattgcaa aagcaattga    240
aatgtggatg atgaatataa ggagcgtgtt tttcagacat ttgttcatta taatatggga    300
tctcaaaaaa atggcctcgt gttggccaac ttttcattgc attgatcaaa cattgggcat    360
tccgggtttt ccgacttttt cagtttgccg taggagaaaa aaggtgaaaa tctttcaata    420
ggtgctccaa tagcaattaa aataagatta tgaaaggttt tggtgatggt acagcccctg    480
cagaggtaaa cttaaattga ccaaaggtgc aacaccggaa gatgtatgta cagctacatt    540
actggtaaag tcgatgctga cctcataggg aaacctctta tgttgactca tatgtattga    600
aaaacaatat gaagc                                                     615
```

(2) INFORMATION FOR SEQ ID NO:221

      (i) SEQUENCE CHARACTERISTICS:
         (A) LENGTH: 647 base pairs
         (B) TYPE: nucleic acid
         (C) STRANDEDNESS: double
         (D) TOPOLOGY: circular

     (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

     (iv) ANTI-SENSE: UNKNOWN

     (vi) ORIGINAL SOURCE:
         (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

     (ix) FEATURE:
         (A) NAME/KEY: misc_feature
         (B) LOCATION 1...647

     (xi) SEQUENCE DESCRIPTION: SEQ ID NO:221

```
atcgccaagc agaagccggt catggtactg gcttcgggct ggcaaaacag atgagtacga     60
aggattgtct gttcgccggt gctttggctg ctacgatttc cggcttggag aaggaggtca    120
tttgcgaaga cggagcgtca gttttccaga actctggggt aactacaata cgcatgagaa    180
gctgatggcc tacctgacgg tcgcgatcat tacgaacgcc tgcgcgccaa taaattggaa    240
agaaggttcc ctattgcact tcactcaatc tcacagaaat tgttcccgaa ctgacttcaa    300
aatttctgcc gcatcaacgg attgcccggc taaccgactc ttctacccgt cactccacct    360
ttctaaacca tccgaacaaa tcttgtcgga gtcggcatct tttttcaccg caaaccatcc    420
cttttctccc tacgctctca gcaatacctt ttggtacgag attgaagatt atgccgagga    480
atacgaagaa tgttgaaaag ccggtacgaa acacttacga tcgtaggcgt acgatgcacc    540
ctgcacgatg caggagacca gcgtaggcgt acggtgctca ttacaacagc taattaccag    600
tacattatgg acaattaaag taaaacgaga acgacctgga aattttc                  647
```

(2) INFORMATION FOR SEQ ID NO:222

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 1153 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...1153

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:222

```
gaaaacttcg actctattgg atccccgcga atttgggaat gaatacagtc agccataacg      60
tcgggcatgg tcatgaaaag catcgcgcag tccggtatgg ccgatacacc gccggccaag     120
gccacttgtt tgatgctatg atctttgccg cttggcgaag tttcttcatc aagatgtcta     180
tgaccgtgtg ctgaaggatg cgcacagatc ggccttgttc ttttctatga agtcgggatc     240
ttcggcaggt tggtcgcgca gagtatagag gaatgatgtc ttgagtccgc tgaactatag     300
tcgtaaccgg acacatgagg acgggcaaag cggaaagcat cgggttgccc tcggaagcca     360
acttattgac gatggggcct ccgggataac ccaccccatc accttggcac atttgtcgaa     420
agcctctccg gctgcatcgt catcgtctgt cctattacct ccatatcgta aggggagcga     480
accagaataa ctgagagttg ccccctgaaa ccaacaagca caggaatggg aaagagggag     540
ctgtgactcc tcacccggct cacgaaggaa gttggccagg acatgggctg aagatgatga     600
cttccagcat cggaatgccc aatgaaagag acaatccttg gcaaagctgg tgcctacaag     660
gagcgatccc agcaaacccg gtccacagtg aaagcgatgg catcaatttc ttctttgcga     720
atgccggcac gtttgtagct tcgctgacta ccgggacaat gttctgctga tgcgcacgcg     780
atgcagttcg ggaaccactc ccccgtaggc tttgtgtacg gcctgtcccg cgacacgttg     840
ctaagcatag tttcgttcct gaccacggct gcagaggtgt cgcacaggag ctttcgatcc     900
ccaatatgat aatgtctttc ttcattgctg ttttttttct atctgcaaaa aaacgaataa     960
aaccttgttt gagccaattc tcctccgagt gttgctgttt tcaattgtga taaggtactg    1020
ccatgagaaa caaggagaat aatggaatgg gaacagacat ccgaaccatg ggagatactc    1080
tctttagagg aaattccggc ctctttcttc agttgagtat agacagcaaa acgacttaag    1140
gcttgtgtca taa                                                       1153
```

(2) INFORMATION FOR SEQ ID NO:223

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 764 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...764

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:223

```
ggcttttttc gcaatttttg cgatggcttg tgcatgccag ggagggacgc cggcaagtcg    60
ttcaccaact ctacaggatc tccgggcgaa atgatgctgt catggacgac caatatctgg   120
gatcgcctgt cggcgaagcc atctacgggc aatgaccgag gtggctccgg ctctgaacca   180
aaacgagccg atcatgctgt ttcgcgcgta tcggaaaagg attttacggg cttcctccgc   240
tatatcgcaa tgtgctgcag atcgacatca accccgatat attcaccaag actttctcaa   300
atacggctat gaccagtggg ctaacggtca gctcgtcgtg ctgtcaacag tcctgcgaca   360
gattcactga cggcctacgt cgaatccaac aatcggccat acagaacctc tttatccgcc   420
acgagctttt cctcttcggc cgctttggca gaaagactgc agtgcggatg ccgaccagcg   480
cgtacagcgt tgttcggata ccatatcaat gtgccggccg atatactcag ccacaaggag   540
gcaaagactt cctgtggatg tccaacaatc agatgcgccg gcgcaaggtt ttttggtata   600
tactttcccc tatcgcggag catcggatct gggactcatc gtatggtgga ggtgcgtgac   660
tccgtgctca aagccaatat agaaggtcgg acgcagggtc ttatcccgtc acggagcgta   720
tgctactgaa gcatcttacg tctacccggg cgaccaaaag cagg                     764
```

(2) INFORMATION FOR SEQ ID NO:224

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 678 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...678

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:224

```
gggaatgggt cttccattga ctatgatttg atgaaattaa aatccggcca ccaatcggta    60
atgccgaaaa aatcagctcc acaaaggtaa gattatcagc aaacgaaaaa gatgctttgc   120
attcagagac cattgttttt gctctgagct atcggcaaat gtactcatcc tgcaaaaaag   180
aagagggcga cccaagatat ttggatcgcc ctctgttctt tatgctaact tcattcagag   240
ggctgcggct cctcctgaaa aaagtgttgt cagatcatat aactttattt tttgcatcca   300
ggctcgcact gatgaaattg ccctgtgcat cgaacagcaa atctactcct tgttgttgta   360
cacgatttcc gccttgtatg tgccgttgga cttctttcga tgtccttgat aaatgcaccg   420
gggtagttcc ggttgacgta atgatgatct tagccttgat gtgagcagga atgttgtcgt   480
catcatcctg tcgtctacgt ttccgctgat gaggttgccc tgtgcatcga acagcaagtg   540
tactccctat tggtgtagta aatttctacg tcataagtac cattggagta cgctcgatac   600
tgtgaatgac agcttcccgg taattctgat gacatagtga tgatcagagc ctgatgttgg   660
cccgaatgtg tttcgatg                                                 678
```

(2) INFORMATION FOR SEQ ID NO:225

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 493 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...493

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:225

```
ggctggagaa taacaagaaa taaaaagacg atgaatcaat tgaccttcac agaaaaacga      60
accttaacga ccaatcaagt ataaaagcga caaaagctcc ccggtctcct tcttcgtcaa     120
tgaatcgaag ttatagtcga gcgaagccat tgaacaatgt ttcgggcgga aagattatct     180
ttgctcccat tcttatgaca ctctgtttag cgaagttaaa atttatgagt cgcagatttg     240
ccgaaacgag agcttggatt tgtcccgtgt caatgaggag gtgttggccg attgatgcaa     300
caccgtcttt ttgaagaaag tctgaaaagt cgcgagggtg cccctcgttc gttttttatg     360
agggacctcc ctctgccaac gggatgcccg gctccaccac gtaatggctt cgtgccatca     420
aggacactat ttgtcgttac agacgatgaa gggttttccg agtggaccag gaaagcccgg     480
ctgggatact acg                                                        493
```

(2) INFORMATION FOR SEQ ID NO:226

        (i) SEQUENCE CHARACTERISTICS:
            (A) LENGTH: 2746 base pairs
            (B) TYPE: nucleic acid
            (C) STRANDEDNESS: double
            (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...2746

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:226

```
gagtaccgtt tcgctggtgg catgtaccat gacttctacc atatcgccgc tttgaggaac      60
tggacgccgt cgatgcttgc acccggtatg gtgatctgtc gaacgtttcg gggtgcatga     120
agttgtatcc catctcgtcc tgatagagta ctgatagggg cgtcgttcta ttctgacctc     180
ttcgacctng acgccgtgtt ccaggtctta tcgaggatac gtcctgtagt cacgttcttg     240
agtttgtgcg gacgaaagcc gggcctttgc cgggcttgac gtgaaggaat tcgagatgaa     300
gtagtactgt ccctcaattt cgagacacat gccgttgcga aagctgccgt tgtagccatt     360
tgggtataat cgttttttta atgatgacga aagggtaggg ggcggttctc gaaatgctgc     420
cgatccttcg ggatataggc aagcctcctg ttgcggaggc aaaaataaga aaaattgtcc     480
gcgaggaaga agtcgattat tttcaaatgg agtgtacatt ccggtatcaa gaaagacata     540
taagagaagg catcctgctc atttgatgtc gggttccttt cctatctttg tcgaaagtgt     600
gtttggtagg gcaatttgtc ctgcctgctt tgcagtaggt gtgattttgt ttgcatagtc     660
ttaaaaatat tgacataatg acaactcaaa agatttgttt tctatatttg gagtcgccga     720
tattggctta aatacaaggt gtagggcatg ttggtttgat gtgcctgata taccgtccta     780
attcactacc gaatcaatta tggttttgtc agaaaaagca aagtattatg ttgtcttgag     840
catcgctacg gtgctcacaa ctatcatccg ctcgaggtgg tatctctcgt ggtcagggag     900
cttatgtgtg ggatgtggat gggaagcgtt attcgacttc ctttctgctt atagtgccgt     960
caatcagggg cattgccatc gaaaatcata gcagcactga aggagcaggc ggaaaaaatc    1020
tgtctgactc acgggctttc tacaacgatt gtttgggtga atacgaagag tttatgcaca    1080
ttatttcggc tacgataaga tgttgccgat gaattcgggt cggaggtgt ggagacagct    1140
ttgaaactct ctcgtcgttg gggttatcgt gtgaaagaat acccgaagag aaggctgtca    1200
tcatcgtatg cgacggcaac ttccaggccg caccatcagt atcgtttcca tgagttccga    1260
tcccgacagc tatacgatta tggcccttat acgccgggct cgtcaatat accttataat    1320
aattagaagc tttggagaag gcattggagg aacacaaaga ccatgtagct gctttgtcgt    1380
ggagccgata cagggtgaag ccggtgtctt tgttcccgat gtggttatat ccgtcgtgct    1440
gcagagcttt gccgcaagta ccatgccctc ttgtggctga tgaagtgcag accggtatcg    1500·
```

```
cacgaacggg  acggatgctt  gctgcgatca  tgatgacgtt  cgtcccgata  ttgttgtgct      1560
cggtaaagta  tttccggcgg  ggtattgccg  gtaagttgcg  tattggcaga  cgatgagtta      1620
tgcttacgat  caagccgggc  gagcatggtt  ccactttcgg  gggattcccc  ttgcctgcaa      1680
agtggcgatg  gctgccctta  cggtggtaaa  agaagacgct  tgccggagag  agccgaggag      1740
ctggggcagt  atttcagagg  agagtgctca  aaatcaagag  ccctctattg  aagttggtcc      1800
gcggacgagg  tatctcaatg  ctattgtcat  cgaaccgcac  aatagacacg  aggcatggga      1860
cggtgcgagg  caatggccga  acgcggcctt  ctggccaaac  cgacgcatcg  catatcattc      1920
gcttggctcc  gccactttgt  atcacacgtg  aggagctggc  caagccgtgg  agattatcaa      1980
ggaatccatc  aaggttttag  agtaaccatc  atggctctta  ttcgcaagca  ggccacgaac      2040
cgggtgctga  tggtgcgccg  gctctttttg  gatttaatgc  cgaaacggcc  agaaacaaca      2100
gcttccaaaa  gaaacgggag  tacccgaagc  agtagcaagg  gaagcgaaaa  aagagttgac      2160
aactacgtca  atctattgcg  cgaatacggg  gtagatgtat  gggtcttcag  gattcgaaga      2220
cacctcatac  accggattcg  atattcccga  acaatggttc  agcacgcatg  tcacaggcga      2280
attggtgctt  tatcccatgt  atgacctaac  aggcagcaag  agcggaaatt  gcccgtactg      2340
gctactgttg  gtaaatggaa  ggggtggatc  gtatcatcaa  tctctccggc  tacgagcggg      2400
aaattgtttt  ctcgaaggca  cgggcagtat  ggtattggac  agggtcaatc  tatagcttac      2460
tgctgctctt  ccgaacgtac  caatccgaag  gtattagaga  attttgtcgg  gaattggact      2520
acaaaggatt  gattttttacc gccacagagc  gaatggtgct  cccatctatc  ataccaatgt      2580
gatgatgtgt  gtggcttgcg  ctatgcgatc  gtttgtttgg  agtgcatcag  ggacgaagcc      2640
gagcgcgtat  ggtggtgaat  agcctgaccg  ctaacggaca  ccgcatcata  gccatagtac      2700
ggagcaggtg  gagcacttcg  cgggcaatat  gctcgaagtg  gagatg                      2746
```

(2) INFORMATION FOR SEQ ID NO:227

     (i) SEQUENCE CHARACTERISTICS:
         (A) LENGTH: 1008 base pairs
         (B) TYPE: nucleic acid
         (C) STRANDEDNESS: double
         (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
         (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
         (A) NAME/KEY: misc_feature
         (B) LOCATION 1...1008

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:227

```
acgccaaacc  ggacttcagc  gacgaagacg  gtacacgggt  agcagagctg  aggacaaatt      60
cgccgaaatg  gaaggctgga  atgccgagag  cgatgcagca  tgttgctgag  cggacttggc      120
atcaaagagg  atctgcacta  tatgctgtga  aggatctgag  cggaaagcaa  aaggtgcgtg      180
tgttactggc  gcgcgcctat  acggtaagcc  tgacaacctc  ttgctcgacg  agccaacgaa      240
cgacccgacc  tcgagaccgt  ttcatggttg  gaaaactatc  tgagcaactt  cgaaacaccg      300
tgctcgtcgt  aagccacgac  cgccacttcc  tcgattcggt  ctgacccata  cggtggacat      360
cgacttcggc  aaggtacaac  agttcagcgg  cactacagct  tctggtacga  atccagccag      420
ctcgctctgc  gccagcaaca  gagcagaaca  agaaggccga  agagaagcgg  aaggagttgg      480
aagagtttat  cgccgcttca  gtgcgaacgt  agctaagagt  aagcaaacga  cgagtcgcag      540
aagatgcttg  agaagctcaa  tatcgaagag  attactccct  cttcccgtgc  tatccgggta      600
ttctcttcac  acccggtcgc  gaacccggca  ataagatctg  gaagtaaagg  ggctgaccaa      660
aagtatcgaa  gggcaacttc  ttttcctgat  ctgaacttca  atgtcgaaaa  ggacgacaag      720
attgtcttta  tcagcgagat  cctcgtgcga  tgaccgccct  attcagtatt  atcaacggag      780
agatacaccc  gatgaaggta  catacgaatg  ggggcaaacc  attaccacgg  ctttctgcca      840
ctggacaatt  cgggctattt  caatacggat  ctgaatctcg  tgagtggttg  tctcagtttg      900
ccaaggatac  gaacgaaatt  tttctcaaag  gttcctcggc  cgtatgctgt  cagcggagag      960
gagattctca  aaaggcatcc  tcctctccga  gggagaagat  ccgtgatg                    1008
```

(2) INFORMATION FOR SEQ ID NO:228

     (i) SEQUENCE CHARACTERISTICS:

```
        (A) LENGTH: 3182 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...3182

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:228
```

```
caataggtga gcaaaaaaga taccttcttg ataatcttct cttttttgcaa ggtttctata    60
attctattgg agaaggtgca atctgtagag cagggagacg aggcggggggc taaaggttca   120
gtcctccggg aagtttgtgc gtcaggagac ggtatcacca tcagtggagt actgccagga   180
ttctttcatg acgaaggtat tgctttgagc acgacgtcgg gatggtgatg cagttctcgg   240
cagattccgc aatcagtacg tagggtgttt cttcggtcaa acgttgctcg aggaatgtag   300
caagtcgtcc acttcatgat ggtgcagttc tccgtctttt ctcttagaca tacgtcgcat   360
agcttgcagt tgtgggactg ctcctcgccg aataggccag aagcatgcgg ctgcgacagg   420
tgttttcttc ctctatgtag cgagcgactg atcgattcgt gctttaagcc gatcgcgacg   480
gtcctcgtaa ccgcacgagg tatctggagc aattctgcat cctcacgtct tgtgagaaat   540
aaattcgtgg cagattcttt tgtggaatat agttcactat gccggcttgt tcagaagcag   600
gagttgctga tagacctgat cgacgctaag ccctgtcttt cggccaattc gctttccact   660
atggaaacat aatccgcaaa caaccctcgt atgtcctcat cagggcagtc agcacgctgt   720
cggaagcctg ttcgctctca tgcggtatag ctcgtcgcgc tgcacctgta ttgtcaggcg   780
cgaggcgtct tttcctcccg atactcccaa atcccggcta catcgaggat gcgatcgcag   840
ccaatacttg tgttgggaac atcctgaaat tccggcaaaa agatcgatgt cgaagtcgaa   900
agatcgctcg aatccctctc cttctcctat cgcaggtagt tgcaaatccg attgtacacc   960
gtggcgatgt attcacgtgg ggaaactcat tgctcactcg ccttttcagg ttgaatatgt  1020
cgtcctccct gccagtaaga cggcataagc cctctctccg tcccgaccgg cgcgaccgcc  1080
tcttggaaat actcctccgg cgaagagggc atttccatgt gaagtacaat cggacatcgg  1140
gcttgtcgat ccccatcccg aaagcattgg tgcagagatg atccgcgttt cccctccat   1200
ccagcttttt tgccgtattt cccgttcaca tggttgagac cggcgtgata gaaatcggcc  1260
gagaagccgt tttcccgagg aagcgtgcca gatcgcgcgc cttatctcgg ttgcgacagt  1320
atagacggcc gaaccgtcca cgcgactgag gatatgcagc agcatcgtct cttgtctgcc  1380
gtccggcgga tggaatacga cagattgggg cggaaaaagc ttttctcagc acgttcggct  1440
ccggaaatcg gaggatgcgt tgtatgtcgt gatcaccggc cgtgtagccg tagcagtcaa  1500
tgccaatacg ggaacatccg cagggcctcc ctgatgtctg ctatcgagag gtatgccggc  1560
cggaagtcta gccccactgg gatatacagt gacattcgtc tacgaccagc agacttacct  1620
gagagcatgc agacggctga ggaaaagttc cgagcccaga cgttcggcga aacgtataga  1680
aatttgtagc ggccgtaaat acagttgtcc agcgtgtgat aatctgctcg cgcgtcattc  1740
cggcatgaac ggctgtcgcc ttgacccctt ttggcgcaat cccatgatct ggtcccgcat  1800
cagagcaatc agtgcgttac cacgagagtc aaacccggca gtagcagccc ggggacttgg  1860
aagtgatact cttaccacca cccgtgggca gtagtcccaa tgtgtccttc ctgccaaaac  1920
ggattcgatg atcgggagct gcacaggcct gaacgaaggg agccccaata gtgtagcaaa  1980
acctcctccg gcgtatgcag agacggagct cgatctcatt ggaaacctcc tccggcatag  2040
gaggaagaaa gtcttcttct ctctcccgat ctcatcactc tgctcatggt cgtacacttc  2100
cccgtgcaat aacgatcggg aacctctttc atatcggtgg agagggata gagacgtcac   2160
ccggtgacaa gtgttgcagc tcttcgctca tctttgttct cgttcgtatt ctatatgatt  2220
ctctgcattc caaattcaga cagcctgtgg actaccccgg ataataatcc ggtgcagcgt  2280
gtgaaaatca tacacgaaag tacaataata cgcccaaccg tctgtctcga acctcagccg  2340
atctccgaca atccggaacc gcaaaagctg cgattgcggt tcgtgttttt gggaaaagtg  2400
agcgagattt ttttcgttgt ggcgcgtaaa tttttctttt ctcgcaccaa aggaaaactt  2460
ttacgcgccg cattttagg gccggtgagt cgccgttttt ggctcgtgaa aaggtggcga  2520
tccccagccg gttcttcttc ggctattttt ttcccatctt gtcggatctt ttggcttaat  2580
cctctcataa tcaggtgtca tccttgagtg gtttgtctct cgattcgcac tttggtctcc  2640
tccgttaggt ctggtttttgg gagcttgttt atggtagcct ttgcagtgcg attctgaggt  2700
atttggtctt tttatactta tctaagaggg ctttacgtac ttctccttat cttgccgatg  2760
agttttttttt gtacctttgc aagaaacgta gatacggtaa aagaatggat tccaaaaaaa  2820
ttctttacat atcccaagaa atttccccta cttgccggaa acggacatat cggtcgtttc  2880·
```

```
gcgcaaattg ctcagaccat tcaggagcga ggcaacgagg tgcgcatttt tatgccccgc    2940
atggcatcat caatgagcgt cgcaatcagt tgcacgaggt gatacgcctt ccggcatcaa    3000
tatgatcatt aacgacaacg accatccgtt gatcatcaag tggcttccat ccagtcggcc    3060
cgcatgcagg tttatttcat cgacaatatg atttcttcaa gcgcaagacg atgtacgaca    3120
tcaagcccaa gcaggaaatg acaacgatga gcgagccatc tttttgtgc gcggagcact    3180
cg                                                                    3182
```

(2) INFORMATION FOR SEQ ID NO:229

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 2568 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...2568

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:229

```
ggcgaatcgg tttcataaca atgagaccgt tgcacaaaaa cccttccacc cctcatatca      60
atcaagacag atacaagcat tgatttgacg aagaaaggga gcttcatgcg gtctctctgc     120
aaacctcaag aatacccga tggaaactgg gaaaatttct gtttgtttgg tgcccatatg      180
tttgaggttt gatcttcctg aaaaacactt aagaatcagc tctgcggcaa aagacttcaa     240
tgaaatccta taaaatagtt gcaaacagct gatagttagc gcattgatgg gagctaatca     300
gctgacaatc gtttcttatt tctcgcctat ttgacgagga aagagtactt ctctaatgga     360
aacttgggga aatttctatt tgctcggtgc cctataccga aggtttgacc tttcccgaag     420
acactaagaa tctgctctgc acaaaagaac tcaatgaaaa tcccctgcaa cagtctcaac     480
agtgcaagag cgaaataact aaatatgttg tgttatgaaa agggagctat atcagaatcg     540
aaaaaatggc gaaatacaat ttgttgttga agcaaaactt gtaagttgac tttaataact     600
aagcattgcc attaaccaat ttatgcttta atctttattc gtctgaatat cttacctttg     660
gtgaaattct tttacgaagc tatgctgtaa atagaaacct gaaatcaata gacgcataaa     720
atcataatta caatctaatt tttgctcatc tctatgaaaa gaaaattcgg ttttctctgt     780
gctggctgct ggggatcgct gtggcgactc ctaaggcaga ggcttgcacc aattgatcgt     840
agccaaaggg gcttcgactg acggttcggt aatcatcagc tatcggcaga ttcgcatacg     900
ctctatgggg agttgtatca ctgggctgct ctgattgggc tgaaggaaca atgcgcccaa     960
ttatcgaatg ggacacgaac aaccacttgg attcattccc gaagtagcgc atacctacaa    1020
tgtcatcgga atgtgaacga acaccaagtg gctattgccg agacgacatg gggcggactc    1080
ccgaattggc cgaaagtgat ggtatcatgg actatggcag cctgatcatg tggctctcca    1140
gcgttctaag acagctcgtg aggctataga cgtcatacca atctggtaaa ggaatacggc    1200
taccatagca gtggcgaaag ttttatgttg ccgataagaa cgaagtttgg attctggaga    1260
tgatcggcaa gggtaggggc gcaaaggtgc tgtgtgggca gctgtcgca ttccggacaa     1320
tgcattagtg cacatgccaa tcaagctcgc atccagcaga tcgatttcaa gataaagatt    1380
atctctattc tcccgatgtc gtttcatttg cccgtgagat ggattcttcc aaggaacaga    1440
caaggatttt agcttccaag aagcatataa ccttataccg aaggtggtct tcgtggttgt    1500
gaagctcgtg tatgggcttc ttcaataagt tcaattcgca tatgggtaag tatgaagctt    1560
ttatacggat cagagcaagg ataaaatgcc tctctatatt gttccggatc gcaagcttct    1620
gtcgctgatg ttcgcgatat gatgcgtgat cactacgaag gtacttccta tgtatgacga    1680
acgatccggg tgccggccct tataaagtac cctacgttgg cgtccgatga gcttcgaagt    1740
ggatggcaag gagtacgtta atgacgtgcc attgccactc agcaaaccgg atttgttttc    1800
gtagcccagt tgctaattgg ctccccgatg ccattggcgg tgttaattgg tttggcgtgg    1860
acatgccgat atggccgtta tgagtccgat ctattgttcc acaacgcgtg tccggagtgc    1920
ttccgtcagg gtaatggcga tatgatgcac ttttcttgga ttcggctttc tggatccaca    1980
attgggtggc taatatggca tatcaccgca tgatcagatg atagccgata ttcgccctgt    2040
acagcgtgaa ctcgaagggc ttgtgaccgc atacttccga ctatcgacaa gcaagcacaa    2100
gagctatcgc tctggatccg gccaaagctg tagcattcct gacaaattac agcaacaaga    2160
ggcagagaaa gcaactgccc gttggaagcg tcttggggaa tatctatggt aaagtacatg    2220
```

```
gatggcaatc gcaagaaaga ggagagtggc cgatcaagac aaatggatac ggtttcagtg    2280
ccatgcctga tttccccggt tatgtcagga atactatcga cagatagcaa catctgaagc    2340
ggccgaacgc ttctcaagaa agaaaaggaa caacattaag ttggtttatt ccctatcttt    2400
gccccgaaat aaaaagagac aagaccgatc aaggtcggtc ttgttctttc gctctgtagt    2460
tcaatggata gaatagtggt ttcctaaacc atagattcgg ttcgattccc gacggagcta    2520
ccaacctgaa aaacactgaa atcaatactt tcgctcatac tactgatg              2568
```

(2) INFORMATION FOR SEQ ID NO:230

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 1122 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...1122

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:230

```
tgccaaactc cttgaagtag tcttctatcg tatggcgacg gaagtgcaga tggcttccaa      60
tgcatcccca tcggcaaagt atcctccaaa gcgattgctg tggcaaacgc cctgtccgga     120
aactccgggt agccgagacc gagcaactga acaggcggcg gatatagtcg gagtaaacga     180
tgcgacaagc ctcgcccctc ccacattgta tgtccgcccc caaagagaag ctttgtgatc     240
gtatgcttca cgcaggcaga ggcaagatcg cggatatgga cggtctcgaa gcgttggcca     300
atggcataca gaatacagag ctgttcagca aggacgaatc gtgccgagga taatacccgg     360
gcggtagatc gtccattcga ggctggattc cttaccagct tttcggcttg caacttggtc     420
agagcatcgt agtcgcccat gaggggcagg tcatattgtc cgcactgatc ataggagctt     480
tcagtctgtc ccatataccc ctaccgtgga aatgtagagc aggtaggcgc ccggggagag     540
cgttccagat tctcgatgat gtagcgcgta cccatcgtgt tgacgtccct gccagtcgaa     600
gacgcttatc cgcattggct ttctcaaggc tctggcatga atcacaaaat cctgtccctt     660
acaggcctcg acggtattat cctgtaggaa cagtccccgt agaaaatatg aatctccttc     720
ttatactttt cgaagaagcc atcgtatgcc cacgcttgat atccnaaacg gaaatctcga     780
agacttgcgc atcgtaagga gttgagccaa aatctctctt cccagcgtgc tgcggctcct     840
gtcagaagaa cttttatctt gttagccata actatttttt ctgtctgtaa gggattatta     900
tttattgtgc cctcaaatat aaggaattag gattagttgc caagcaggaa cagccggaca     960
gaggcaaaag cactccttac ggattgccgt acgcagtcct tttcaagatt gtacttgcag    1020
gtgtgggcaa atccccttag cgttgaccgc cgaagaagtc tgctatagcc agcagcagat    1080
ggcacccagc gtggaggtgg caagccttgc caagaaagag cc                      1122
```

(2) INFORMATION FOR SEQ ID NO:231

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 685 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...685

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:231

```
gttcgaaaag cgttttaatt cctgtatggt gcaattgaaa tatgatagag agataggact    60
cgcgctcacc gatacgtttt aattcctgta tggtgcaatg aaatctcccg ggttgggcag   120
cacggctttg aggaattggg ttttaatcct gtatggtgca attgaaatcc gttacaaata   180
taggcttttc tgtttgatgt gaggagttta cgaaaaggtg aaacccaaaa ttcagacatt   240
catagtgtcg atgtctgatt ctatgaaaaa ccaaggggtg tgacgactga tatatttatt   300
gattatcaat catttcaaag atcgccggag gttaatcatg gcaaaggctt gatgaatttg   360
ctcgagccga cgcttcaaaa gatagatagc ggagctgtat cgtgctgtat tatagaaata   420
tatccgttgc agaacgctct tgccaattat ttcttttttcc aaccaacgtt cttgtctgga   480
agaaaatatg tcagactatc ttcttctttt tccataattc cggctgctct gctcttcagt   540
ctaagagctt gacttccgat atttccccct cgaacacaga gttctgaacc aattcagata   600
ttttctgcac agtttttaaca ttttgccaac acgctttcac cgatatcgta cactaaaata   660
atatacatta cccaatacat cttaa                                         685
```


(2) INFORMATION FOR SEQ ID NO:232

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 669 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...669

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:232

```
ggcgagcttt ttcacgcaat tggatcangc tcttttactc tttccagtta aaactcatat    60
tcttttctaa atagttaggt ttgctatttc atgacataag gcatactcgc cggaaagcag   120
tcggcactgt ccggtcgccc gtagggtgtt actattattt atgatcacat acctcggtca   180
gcacaccat agtactttcg ggtgcaagaa accgatattc aagccctctg ctcctttgcg   240
agcttttcgt cgatcagctt aatgccttta gaggcggcat cggccaatgc ttcgtggcat   300
cttccacaca aaaagcaatg tgatggatac cttctccacg ctttctatga atttggcaat   360
agggctttcg tcagaggtcg gctccaacaa ttcagcttgg tctgccctac catcataaat   420
gcggtacgca ccttttggtc ggtacttcct caatgctgta acacttgagt cccaatacat   480
tttcgtagta gggagggctt cttcgatact tttgaccgca ataccgagat gttcgatgta   540
gataaattca ttgctctcta ctttttttatt gtgttgactc ttctaccatg tccgaagatc   600
ttaatgcaaa gcattttcgc aaatgtagaa attattctga tggactgatt aagtattgnc   660
catataatc                                                          669
```


(2) INFORMATION FOR SEQ ID NO:233

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 1000 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

(iii) HYPOTHETICAL: NO

(iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
     (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
     (A) NAME/KEY: misc_feature
     (B) LOCATION 1...1000

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:233

```
tcctaaacct ctttccgagc aatcatctga ggggtaaata tgacagagaa taaggtatta     60
cggtgtgatt acatatattt gtacttaaat aatccactca aaacggatga aaacgattgc    120
gaacgagtct tttcttcttg atacaaagtc cccgaaccta ctctgaggcg tcttccctgg    180
tatttgtctt acgtccgctt ttgcatgcgg atggatgcga gtcggtgtct tccacgcgga    240
tcgctgtgcc gtaggagtgg atgcttcgct cgtggccaag gatctctcct atgttcggtg    300
gatgggcgta cacgggtagg gtaccgggtg gcggacatgg tggtgtgctg aacgactttc    360
tgggctttac gcaccaccac cgtgctttcc tctcggggtg ggaagtctgg gtgctgcttt    420
gttgcaggac tcgggtttgc gcacttcggg ttggagattg ccgccgggtt cgatgtgaat    480
ccggatattg ggacactaat atcaatggca tccccgttta ccataagagc cgggttgcga    540
gttgtgcgct cgagagcgtg tggatatagg tattcttacc gttccgatcg ggcggcacag    600
tcgatggccg atgagatgat agcagcaggg atcaaggtat ttggaatttt accccttggc    660
gcatcagtgt acccgaaggc gtggtctaca gaatacgtcg atgtatgccc agttggctgt    720
gatgttcaat cggataaatc gctaccttag gtctccgaag gctgaacaat cctcctttgc    780
ccttttttata ataagggctt tcgctcgctt tggaacgatg aagataattg ctgcggcatg    840
aactatggtg cgcatgtcag cgaaatgcga cgtgcggaca tcttcccgtt gctccctgtc    900
cggatggagg gggagccgat ttttgtgtgg agaacctgtg cttttcctca aggccgactc    960
cttgttgcgc gaagggcatc cctttttctat ccggattttt                       1000
```

(2) INFORMATION FOR SEQ ID NO:234

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 406 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
         (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
         (A) NAME/KEY: misc_feature
         (B) LOCATION 1...406

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:234

```
caaagagaaa aggcgtgtag atggtatgcc tggcacacga tctacacgcc ccggagttat     60
tcgcttctga gatcgtcgag tacttcgtcg tacttgtccc gatctcttcc accatatctt    120
cggtgattcc cttcattttc ctacggtctt ctggtagcga ttcttggctt cataatagcc    180
ttccaccacg ctatccttac tttgtcggct gtactgttga tgtcttcaac gaagcgagta    240
cgctttcacg atcagcgaaa taagcagcgg tagcccnaat agcaaggccc actacagacc    300
gagagaaaac tttccttgtg agctcataaa aaatcctcct tacttattaa atgctttgaa    360
tcaattttgt cagaaaacca attcacncga atatgaatcg tttcgt                  406
```

(2) INFORMATION FOR SEQ ID NO:235

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 791 base pairs

```
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

   (ii) MOLECULE TYPE: DNA (genomic)

  (iii) HYPOTHETICAL: NO

   (iv) ANTI-SENSE: UNKNOWN

   (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

   (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...791

   (xi) SEQUENCE DESCRIPTION: SEQ ID NO:235
```

```
aaaaaggttt tgggaaatgt agcctctatc ggcaatgagt ttgccaaaag attcttggtg      60
aatgttccgt ctttcagagg ttctctgtca tcacaattcc cggtgtgatt tgatagttga     120
tgatttcacc cctgtcgttg ataacaaatg cagtttgaat ccataaaacc aacccatggt     180
gctttttgcct ttttgaccca tcccctcatt gtcctatgcc catgagctcg tttgatatga     240
caagcttcag tggggtggaa tcgatgaaag agatgcctgt acattgaccc aaacacacat     300
attgagaaat gctatcagct tgaaacccac cctgctttgc agcccacaaa gcgattataa     360
gagacaagat gtgggaactc ggatcgacaa gataggtgat gtattgaaga taaaaagctt     420
tcaaatctcg gtatcttgac aatgaaacag gatcaggatg gtcatgacct cactgtccga     480
catcttaaac ttctattcct gcgtttttttg tctgcctctt cgagggtctt tttcttgatg     540
cttcatcaaa aagcttggag aaatcatcta tgatgcaaaa aacatcaata tatttgtctt     600
cataaagtag cgtttgttc gttcgtatct tattgatatc aactgctaag atacaaataa     660
ttcgctactt tttcaagcat aatgccacgt tctttgggcg tttaacccta atcaaaaaac     720
aaattcattg gtgtttctta cgtcgaactg acgttctacg gaataccgct atgctccttg     780
tggttagtta g                                                          791
```

```
(2) INFORMATION FOR SEQ ID NO:236

        (i) SEQUENCE CHARACTERISTICS:
            (A) LENGTH: 664 base pairs
            (B) TYPE: nucleic acid
            (C) STRANDEDNESS: double
            (D) TOPOLOGY: circular

       (ii) MOLECULE TYPE: DNA (genomic)

      (iii) HYPOTHETICAL: NO

       (iv) ANTI-SENSE: UNKNOWN

       (vi) ORIGINAL SOURCE:
            (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

       (ix) FEATURE:
            (A) NAME/KEY: misc_feature
            (B) LOCATION 1...664

       (xi) SEQUENCE DESCRIPTION: SEQ ID NO:236
```

```
agcagattat gccatcacgg cctctcactc ggagggtttc ggtctgaata tctggaggct      60
actgcttgtg gaaaacccgt tgtagccact gatttgcccc attcagagaa atctgcggca     120
caggctttca ggacaacgaa ttgttttttc tgtaggaaac caaaaagaat tggaggattg     180
catactaaaa agccttgtca tacgttcaac cctcaaaaag tctccgatat caggcatcat     240
ttctcgcgga aacaatgtct gtacaatatc agaactatta tacggagcta tcagtccact     300
aaaatgaatt caatgaagag tgcatgttcc gattattact gctcaatcgt actttataaa     360
agcaaaccgg atattattcg ggatgtcatt actccttttt ctctgatacg gtaactaaga     420
agaagcttat cctcatagac attctccgac tgacagtctt cgtgtcctcc aagaagaaag     480
accggaggat ttcaggtatt tctttaataa ccgcaatata ggattcggat cagctcacat     540
atcggtatta gagaggcagc tcgcttcaat ccttcttatc attaattcta atcctgatgt     600
```

```
gcagtttggc cctgaagtgg tgccgacatt ggcttcaaca tggaccgaga atcctgatat      660
agga                                                                   664
```

(2) INFORMATION FOR SEQ ID NO:237

      (i) SEQUENCE CHARACTERISTICS:
         (A) LENGTH: 3236 base pairs
         (B) TYPE: nucleic acid
         (C) STRANDEDNESS: double
         (D) TOPOLOGY: circular

     (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

     (iv) ANTI-SENSE: UNKNOWN

     (vi) ORIGINAL SOURCE:
         (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

     (ix) FEATURE:
         (A) NAME/KEY: misc_feature
         (B) LOCATION 1...3236

     (xi) SEQUENCE DESCRIPTION: SEQ ID NO:237

```
tccccgccac ctcctgaagg aaatagttgt gcaatctgtc cgtgactgcg gaaaagatga       60
ccccatagaa aatagaatcg ataatattcc cgataccgcg gcaatgatca gagacaaaca      120
agagagaaag gcgagtgtat gctctcgttt cgtaccaatt tggccaataa atagatacaa      180
aagcccatgg caacgagcga aagagactca agaagagttt gctccctaat tctataccga      240
aagcctcccg ggattttcca cgaaatggat ctgaaaccaa ggggcgacaa cgtggactgc      300
cccagtacca tagtcgtctt cacccatatc ttgatcacct gattacgacc agaagcaaga      360
caatgagagc tgcgactact tttccctgag gcgacgggag agaaaagaag ccatctacta      420
tttcttctcg ttcattttgg ctctatgctc agcgtagcat gaggtacggc gcgaagtcgt      480
tctttgggaa aagtttgccc gtttcgcggc aaacgccgta agtcttattc tcgatacgtt      540
cagagcagct tgcaagtttt ggataaactt catcagtcgc tgtgccaacg tccggattcc      600
tctttcgaca gtgtggctgc accctcctcc aacacctgaa cgtgggagag gtatcagaca      660
catcattacc ctctgaattg ctgacgccgc acgcaactgc tcgtagtcct tgcgagcctg      720
atccaatttg gccaaattat ttgcttgaat tcttccaact cttcgtcggt gtagcgtgtt      780
tttttaccat ttgtatctaa ataatcgtta gtggaacaga tttctcggca gacgaaaatt      840
catatctgcc tccgaagtct atccctgatg tttaacaact tgatgctaag gacaaaatca      900
tcgaaatcca gctccactcc atcgctgaca gatcgctgat ctccaacgat tcggcctgga      960
tttgctgggc gatatagtca ggtgctctgc caccacttta tccataatat cgttagacaa     1020
gagaaggact ccaccttgtc cgacacttcg aaaccgcttt gcttgcggat attctgcaac     1080
gattcacaag ttcgcgagcc agtccttcgg agcgaagctc atctgtcctg taatatcaag     1140
ggctacggtc agattgcctt cgttggctac gaagcctccc ggaatatctt ccgagacgat     1200
ctccacatcg gccaattcaa gctctccgga gtcccggcca cttccatccg gaaagtgccg     1260
gccttctcga gggacgtatc tcttcctgcg tcatggccgt tacagcttct gccaaagcct     1320
tcacactttg ccgtagcgtg ggccgagtcg tttgaagtcc ggtttgattc gttgaccaga     1380
atacccatgc tgtcatccac gaatcgcagc tctttcacgt tacctcacta aggatcagcg     1440
gctgtacgga ttcgatacac ctgcgctgct atcgtctata gccggtatca tcagtgtagc     1500
caatggttgg cgtactttcg attcactctt cggcgaagtg ccagcaccat agacgaaatc     1560
tgctgagcat ctgcatgctc tgttccagtg cacggtccac ctgactttga tccggccggg     1620
gaagagcgcc aagtgcacgc tttcgtcttt gcccgtcaga tctcggacag tcggtcagca     1680
tagaaaggac tgatcggagc catcagtttg gatacgtaag caaggaggta taaagcgtct     1740
gataggcaga gagcttatct tcggcatatc tcctgcccag aagcgacggc ggcttgagac     1800
gcacatacca gttctcagat tctcggagac aaaatcgctg atggcacgac cggcacgtgt     1860
agctcgtagt cgctcagttg atcatccact tcacgaatca atgtattcag tcggaaagta     1920
tccagcggtc gatctccggc ctcttggcga aaggaatgct tcttcttctc ccgtaaagcc     1980
gtccaaatta gcatagaggg caaagaacta tacgtattgt ataaggtacc gaagaatttc     2040
ctgcgtacct cttccactcg tccgtgtcga atttgagatt gtcccacggt gaagaattgg     2100
tgatcattac cagcgaagag gatcggagcc gtatttcttg atggtctcga aaggattacg     2160
gcgttgccga gacgcttgct catcttattg cctttcttat ccagtccaag ccgttggata     2220
ccacaacttt gaacgaactc gttcctgata tcatgtggct atggcgtgaa gggtgaagaa     2280
ccatccacgc gtctgatcca cccttcggct atgaagtcgg cagggaagac ggaaccgtcc     2340
tccactcgtt cggattctcg aaaggatagt gcatctgggc ataaggcata gcacccgagt     2400
caaccataca tcgatcagat ccagctcgcg gcgcataggc tgacccgagg gagcaaagtg     2460·
```

```
tgatcccatc tacaaaaggc ctatgcaggt cgatcttgga tagttctcct cggtgtagac    2520
accgggcttg aagcctgccc atgggttggc tccatcatac cggctttgac ggccttctct    2580
atctcgttgt acagctctcg accgaaccga tacagatctc ttcggaacca tcctcagtac    2640
gccaaaggge aatggegtee cccagtagcg actgcgagaa aggttccaat cttgagattc    2700
tccagccatt tgccgaagcg tcccgtaccg gtgctttcgg gtttcaatat atcttaccat    2760
tgttggctat catctcctct ttgcaggctg tcggcggata aaccagctat cgagcggata    2820
gtaaagaacg ggcttgtccg tctccaacag tgtgggtagt tgtgtgtcat cttttcgatg    2880
cggaaaacgc gttctgcatc ttcagcatca cgcagagttc gacgtcgaga gtctcgtcct    2940
ctccgtcttt ccggcatcgt acgcattttt cacgtagcgg ccggcatatc gtcatagagc    3000
ggcagatcca tgtgcttctc tacaaagaca ggatccaatc tgtcgttggg aaatagcggc    3060
cggccagatc caccataggg cgcatatccc ctctttgtca cgaagcatca agggaggcac    3120
accgcttttc ttggcccgcg gtcatcgtcc gcaccgaacg taggtgctat gtgcacgatg    3180
ccggtccatc ttccgtggtc acgaaatcgc ctgtgatcac tcggaaagca ccttgc        3236
```

(2) INFORMATION FOR SEQ ID NO:238

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 613 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...613

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:238

```
tggttcgctg ccccaagtcg ttgtacgatc gtcttcgcga agaggatagg cgcgtttccg     60
agtacccgtc gatattctgt ccgatgagga cgatacggcg gtacggaaga agacccccttc   120
aaaaacacgc tggtcaggca tcaggatgct tcccctactt cgccttgcga tacttcgatc    180
tgaagaaagt cttcactccc tccgcttcca tatagatttg ggcacctacc acttcgccat    240
atacagaaga acatcggcga gcagccggaa gaccgccatc tgacgcgcaa cctgacggct    300
tcggccgaat acaggatttc gccgaggagc atagacccga agatggaagc gtttggtgcg    360
ggatttggac tacttcgaga ccggcgacaa gcctatatca cccaaaccac tccgcactat    420
catatcgaga aaggaaagat cggctgaggt tcgtgccgga agggcagctt ctttggccgt     480
cgccggaggt ggagcaaccc gaacgggacg aaagcaaata cgcccaagac aaacggttcc    540
ggcagaagcc ttcctgagcg tacatgagct gatgcccatg atgtctatac ttcctgctga    600
gagaaaagta ttt                                                        613
```

(2) INFORMATION FOR SEQ ID NO:239

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 459 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...459

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:239

```
cactgttttt ggcattgcgg atgggatcat ggatgtcgat aggttcgtgc agatattgta      60
gtcaccgcac aggatcaagt tagggcgact cttgcggatt cattgacata agattggaag     120
tgctccagcc aaaccatctt gaaggccgac gctcatcgcc actcgtcccg gatggatgat     180
aaacgcttac gatagaagat cgccgaaatc ggcacggata aaacgacctt ccgcatcgta     240
ttcttcatac ccatgccata ttctatatga tcaggctgat gctttgtgat gataccacac     300
cgctatatcc tttcttttga gcccgaaaaa aagatacgag ccgtagccca gtgcttcaaa     360
tccttcattt ttcgaattgg tcattctgca tctagtttcc tgcaggcaca agcacatcag     420
gattctcttc tcgaagccaa cgatcagatc ttttcttca                           459
```

(2) INFORMATION FOR SEQ ID NO:240

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 628 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...628

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:240

```
gtgaatagac tcacgattgt cctcggcata agcatagcca gagcaaaacg agaaagctga      60
ccagtagatt gacgccacaa ctgtagcgat aggccgactc acccgtcccg gatttttagc     120
cccgtagttg aaacctacga tcggctgatc ccctgagcca caccgatgat aatcatgaaa     180
aagagcatgg catagcattg ataatcccga atgctccgat ggccaagtcg gtagcatctg     240
ctgtccgccg taggatacga aagaacgatt catgatgata ttgaccagac tgccgtaagg     300
tgcatggcga agggtgctac ccctatagcc gttatgccgc cgacaccggc agggacaggc     360
ggaaagccga gcggtggaaa cgtacgatac tgccttacgg aaaaagtgcg aaaggacgta     420
gaccgaacat actatcatgg aacgacagtc gctatggcgg ctccgcttat ccccatcccc     480
aacggataga gaagatgtag tccagcacca cgttcgtcat agccccgatg atcatcgtat     540
catggctttg cgcggatagc ccgaaagctc tcatgatagc attgtagcga agcttcagag     600
ctgagaaaat attggcagga ccacgtat                                        628
```

(2) INFORMATION FOR SEQ ID NO:241

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 1372 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
      (A) NAME/KEY: misc_feature
      (B) LOCATION 1...1372

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:241

```
tgcttcttcg agacagtccg aatgagtccg atccacaccg aaatcattgt gaatatgagc      60
gtattcttcg tgatgtcgtc cacgctcgtt cgttcgtgtc gctggtagga gtggcgaaag     120
caccgttctc gtcgcgatag acaggcagcc ttcgatattc aattcgccac gtccgattcc     180
gacaaaaggt tcgtctcata tcccacgccg aatacaatgt cggagcctac cttatcacgg     240
tcgaaacccc gatagagtac cctgtacgaa gagataaaag gttgcctatg tccacaaagc     300
attgatataa taaagcccca atccgcgtac tacacgtcgg gacactgctc ggcagacggc     360
ctgtagcggt taggatcctt gccggtacgt tttagcagct gcgtgtggct gctatggcag     420
ggatttcttt gatggccggg agtcgcaagt ctgtatcagc cgatcaagcc tctccgttca     480
tctcatctat agagtggatg gcgaccggcc tgctgcaact ttggccgtac cactcctacc     540
gaaaagccgg acaatgatgc agaataggta cgtcaaagct gatcccgggc atcgtctcct     600
tcgtatcgta ttcgatctcc aaatcaaaat caatgtctcg agaccttctt catcctcgtc     660
gtcttctatc gatgccggaa caaatctcct cctcatccca tgtaagactg gtcaaatcaa     720
gagcttggcg tactagctgt ccggctcgtg aagggtctcc ttgctgagtt ctttccacaa     780
gtatctttag ctcttccagt ccctgttgtg ccacggcaga aatgaaaact acgggcaagc     840
ctgtcggcag ctcctcccga agcatctcgc acagctcttt cgcgatgagg tcgcacttgg     900
ttatggccag cactttgcgc ttttgtgcca atcttcgttg tatgccacca gctcccgact     960
gagtatctcg tattccttgg aatgttgtcc gtatcggccg gaatcatgaa gaggagcaaa    1020
gcgttccttc gatgtgccgc aggaaacgca gtcccagtcc tttccccgat gaagcccctc    1080
gatgatgccc gggatgtccg ccattacaaa ggatcgcttg tctcgatggc tacgataccg    1140
agattaggtt ccagcgtagt gaacggatag ttggcgtctt cggctttgca gcagtgagca    1200
ctgatagcag tgtcgatttg ccggcttggg aaatccgacc agaccgacat cggccagcat    1260
cttgagctgc atgacaccat acgctcctgt gccggctcgc cgggctgagc atatcggggg    1320
gccgattggt agcggtcttg aagaacgtat tgccgtgtcc gcctcggcct cc            1372
```

(2) INFORMATION FOR SEQ ID NO:242

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 480 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...480

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:242

```
ttgcagtgat gggtccgagc ggagctgtag aagtaatttt tgccaaagag tggcagcagc      60
cgagaatcct caacaagcag cattggaaaa ggaagaagat atcgtcaggc ttttgccaat     120
ccgtacaatg cagcctctta cggctactgg atgatgtgat cgagcctcgc aatactcgtt     180
tccgcattat tcgtgccttg aacagcttcg tacgaaaaag caaactattc cggctaagaa     240
acacgcaatg tgcctcttta ataagaggag tttagtgcat cgaccatgaa tattgcaggt     300
ttagccatat ccttctgact ttgtttgtca tagcctccgg acactctttg cccagcaggc     360
agcacagctt cgcttgaatg aagtgatgac ccgaatgtgc gngactatca ggacagctat     420
ggcaatcata agccgtggat taaaatatac aatcctccan ccgctacggt ggatatcaaa     480
```

(2) INFORMATION FOR SEQ ID NO:243

```
  (i) SEQUENCE CHARACTERISTICS:
      (A) LENGTH: 444 base pairs
      (B) TYPE: nucleic acid
      (C) STRANDEDNESS: double
      (D) TOPOLOGY: circular

 (ii) MOLECULE TYPE: DNA (genomic)

(iii) HYPOTHETICAL: NO

 (iv) ANTI-SENSE: UNKNOWN

 (vi) ORIGINAL SOURCE:
      (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

 (ix) FEATURE:
      (A) NAME/KEY: misc_feature
      (B) LOCATION 1...444

 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:243
```

```
ctggaattgg ttttactgag gaaaataaga attcttttga tacatacaga gtggcttcaa      60
aatgtcaaaa ggaggtaaag gcttcggtcg atttatgtcc taaaatactt ttatcatgtc     120
tcaattgaaa gtatcttcta tgaagaggca aatataaaca acgtagtttt acatttggtc     180
acgcagatga gataatgaaa atgagcaaat tgtagatatt gaatccgact ctgacctgca     240
tacagtacag ttttacatct ttcttccatt aagtcttttg atttagataa agggttgaag     300
ttattgccag aaaactcgtg gagcgtttac ttgtattctt tgtcctggag gggaatatac     360
tccaaagatt acgattaaag aagagaatgg ctcaattcaa tagtattgaa taactatatt     420
ggagacaatt ctgatattca aaaa                                            444
```

```
(2) INFORMATION FOR SEQ ID NO:244

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 456 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

   (ii) MOLECULE TYPE: DNA (genomic)

  (iii) HYPOTHETICAL: NO

   (iv) ANTI-SENSE: UNKNOWN

   (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

   (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...456

   (xi) SEQUENCE DESCRIPTION: SEQ ID NO:244
```

```
tgcaaaaata tcctttaccg gctaaaactc agataaaatg tgttttncat gcaaggatat      60
gcgccactga cctgtcgaaa agagcgtgac aactactcaa attgaacgta agcataatca     120
ttcgggtgcg tgcccgactg atagactggt atagatcaac ttataatcat ccaaaagatc     180
aggacgctcg tgtgtgtaac atcgggaaaa ccaaagctaa agcgcagttc ggggcacaat     240
ttgaaaaagg caggtaaaaa tcgcatccga gaccgatctg caccccgtaa tcgtcgcttt     300
ggtataaatc tccaaccect tctttcgccc cagctccata gtcagtaagg cccgccgatg     360
aggtattgga cgcataattg gttcaagcgc cggaaccata ttttcaataa ttagcggaaa     420
ttccaaatat ttggatccga acggagaaaa gaaggc                              456
```

```
(2) INFORMATION FOR SEQ ID NO:245

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 474 base pairs
```

```
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...474

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:245
```

```
ggcttgcgtg tggatgagtt cgggactgaa ccacatacgg ctctcttttt cgtggacagt      60
gtgcggtgtt caaggaaatg cagaaaggca ggtatttctc cttcaccctt tgcaggaaat     120
ccgtgtcgtc cctctctatc ctccctattt tcttacccaa tagcgcgtct cccctgcgtc     180
gatgatgacg ggcagggttc gttgttggag catagtacaa acttggcaaa gaacgaaatc     240
tcgtcctgtc cttatcctcc gcctccacct tgtaggaaag ggtggtgctg aggtcttgag     300
ccgctcgctg tcctccctgc ggtcgagaag cacctngtcc acgggatgag cagtttccca     360
gcctagtccg agttgaactg acttcgaaag tctcgttggt gttgaaggtt acattgctgc     420
ccaagagggc tttgaggaaa gttgagaaat tgtgctnttg cccgtgtttc gctn          474
```

(2) INFORMATION FOR SEQ ID NO:246

```
        (i) SEQUENCE CHARACTERISTICS:
            (A) LENGTH: 476 base pairs :
            (B) TYPE: nucleic acid
            (C) STRANDEDNESS: double
            (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...476

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:246
```

```
ggctgcgaat agcttgtaaa tacgattgat ctcaacacct gcagctttta ctcatttaaa      60
tactggacgg ggttttcata cttcttaaat gcattggtag tgatacctgt gtcaatcgga     120
ctgttttcaa atctgtggca ttcataatgg acgtgcagat acactgactg taaaatgacc     180
ggctttttct gtgctattgt cctgcttttc tttactgaca tagctatttg ggcaaaaact     240
tcacgttttt cttattaata aaatactggt ataaatctat atcaggaata cgagtgcagc     300
agatttcaat tgtaacgact cttttaccat cttgatcatg ttatgacctc tttgacatac     360
tggttggcag cgttaccttc caaatatagt tcatcaagtc tttcaagagt gctttttagtg     420
aaatttcgga caaaatgctt atgatgaatc tttttgtaga gttgcgattc taataa        476
```

(2) INFORMATION FOR SEQ ID NO:247

```
        (i) SEQUENCE CHARACTERISTICS:
            (A) LENGTH: 588 base pairs
            (B) TYPE: nucleic acid
            (C) STRANDEDNESS: double
```

```
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
         (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
         (A) NAME/KEY: misc_feature
         (B) LOCATION 1...588

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:247
```

```
ggcgtaaaaa tcgttataga accacttacc acttcaatga caatacggaa aggcatcccg      60
cctgatacga tcatatacgg tggaacatgg catggctttt ttgacctctc tgcggctatg     120
gggggagagg ctgaaacccg acaatggtgc gtagcgggct gatgcatacc gatcatatac     180
attatacggt gggtggtata cccgtcatgg aggactggtg gccgatgcct tactcggctc     240
tattgccgtg gcaaaatgga taggagcgac cagtccaaac tctaaaataa aagaagtcca     300
agatcgtgca ctttttcgat tcgatggata tatcccgcct gtggatatat tacagtatga     360
tgcttctgcc cccatgattt tttcgagtgg gagttcttca tcctctttct tttgttcctt     420
ccgctataca tcctgctacg cggcaaaccg gactgcgtat tgtatacgta tctctctttt     480
ctctttattt tactataaga gcagcggtct tttcgtcctg cttctttttgg ctgctgctag     540
agcgacttcc tcatcggtcg gcttttttgtc ccgtcagcag atccaagt               588
```

```
(2) INFORMATION FOR SEQ ID NO:248

        (i) SEQUENCE CHARACTERISTICS:
            (A) LENGTH: 1014 base pairs
            (B) TYPE: nucleic acid
            (C) STRANDEDNESS: double
            (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
         (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
         (A) NAME/KEY: misc_feature
         (B) LOCATION 1...1014

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:248
```

```
gcgctctcga cggttcttcg ctgtgatcga gagcaccgag aggcggtcac gacactctcg      60
atggcccgct caatggctcg cacagtgtct atcgcctcgt gaagataacg agtttctgct     120
ctggattacg ctccagactg agcagacagg tagcagctgt cgcttaaaat cgtctagttt     180
gggatcgtcg gagtagtgct ccactgctca tctagctggt cgatgagggc tagatcctga     240
cggagagatc aatgtattct ggagcaaagt cctcacgtcg atactctcta tttccccttt     300
ctcattcgat ccagaggagt tgagcttgtt gatctttttg cgtgatcctc ggcacactct     360
tcgaaggaga acaatttcct cgtactatcc catgcttacg gggattgagc tctgcattca     420
catctatctg tgggcagatg atatggtatc gtgctcccac atatccacca tattttgggt     480
gtaacgcttg gattttttgag cgagaccttg aaggcggaga agctactctc gatgcgttta     540
ccaggccaat ctgcataatg cgtgctagct gatgggagaa tcgctcggat ccatgttgcg     600
ccccgagtag agcttacgcg tgctctcgtc tctcaggact caatagctcg atatcggtag     660
tagcatagag aggtagagct gtcgaatgaa aattctcttt cggcgcaatg cagtccatcg     720
tacgagcgaa gagttggcaa ggctcttgct catacgatac tcaaagctat gagggccact     780
aatccgggaa aggtaagttt ggtctcaggg tagtacttac ggatgtcggt tcggtgcgtc     840
tgacgagtat atcctgtagg acgcagtctc ttacgcgact agcaagtcat tgagtagttt     900
cctactctgc tgtatttgct ctgccgttgg gcttcgtcgt agcgagagta tatgacagat     960
```

tgatattcac gagctatatc gcaaaaaaac tctccagatt gccaccattg gcct   1014

(2) INFORMATION FOR SEQ ID NO:249

    (i) SEQUENCE CHARACTERISTICS:
       (A) LENGTH: 401 base pairs
       (B) TYPE: nucleic acid
       (C) STRANDEDNESS: double
       (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
       (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
       (A) NAME/KEY: misc_feature
       (B) LOCATION 1...401

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:249

```
agaccgttcc gattatgaaa gcagctacta ccgtcagccg tataaggatg ttttcatcgt     60
tgttttcgtt tatgcaattt gttcatataa agcctctcat tacagaaaga gcctgtttta    120
gtgagttccc gatagccata atccgtttga ttttgtcgat tatcttatcg gcttcgggct    180
tttccaatgc gaataatatg cctgtaaagc atcgtaagca gtataattct tccaatcttc    240
tcctatttcc ttgccaattc tctgactttc tcataatcgg gatgatatgc tttgaatcac    300
gcataatcgt gtcggtggca tcttcatcat atccatcgca aaagttatgt tgttcaaata    360
gctggcatgt tgaatgnaag tcgatacacc cacccgaata g                        401
```

(2) INFORMATION FOR SEQ ID NO:250

    (i) SEQUENCE CHARACTERISTICS:
       (A) LENGTH: 408 base pairs
       (B) TYPE: nucleic acid
       (C) STRANDEDNESS: double
       (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
       (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
       (A) NAME/KEY: misc_feature
       (B) LOCATION 1...408

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:250

```
ggtcgaagct cgtagccact gctacatgct tggcctgatt caaatcgcta acggcacttc     60
ttccggaata accaacacag gtaccttgct cgaatctata cttcggctgc aacgcttccg    120
atcagatccg aatccttgcg cgatttgctc gcgtccccat cacgatcatt acgggtctgt    180
gtcgcttgca gtaactagga ttacatcttc cggagcaccg tccaaaagga cagaggagaa    240
agatattcgg gaagttcctc tcgcgttatc ctttcacgca gctctttctt gagctgttca    300
tcagacgttg tacacgctgg tattctttgc gcaggctgac ttcttgctga gctggaacac    360
aagccgtatc gcccaccgta agaaggtgtg gaaaaaatgg actgatat                 408
```

(2) INFORMATION FOR SEQ ID NO:251

```
    (i)  SEQUENCE CHARACTERISTICS:
         (A) LENGTH: 507 base pairs
         (B) TYPE: nucleic acid
         (C) STRANDEDNESS: double
         (D) TOPOLOGY: circular

   (ii)  MOLECULE TYPE: DNA (genomic)

  (iii)  HYPOTHETICAL: NO

   (iv)  ANTI-SENSE: UNKNOWN

   (vi)  ORIGINAL SOURCE:
         (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

   (ix)  FEATURE:
         (A) NAME/KEY: misc_feature
         (B) LOCATION 1...507

   (xi)  SEQUENCE DESCRIPTION: SEQ ID NO:251
```

```
atattggatg tgcccgtgaa agatgagaaa gctgcctgct ggcatgtctt tccatcatca      60
cggacatgta tcagcccaat ccacagcgaa tgaaggacgg atctccatcc ccaaaagcaa     120
cggttatgag tcgctccacg ttacggtatg ggaccgcaga atcggtgggt ggaggtgcag     180
attcgctccc gtcgcaggac gaggtggccg aaagaggatt ggctgctcac tggaagtaca     240
aaggttcaag agcgagagcg gattggatga gttcctcact tccgtacgcg agaccttgag     300
gcacgcgatc actcctcgga cgattcggcg gagacggtga aaacttcaag atgaacctct     360
tcaccgatga gatctatgct ttcactccca cggagaactg atcaagttgc ctcagggagc     420
ccagtgtgct ggacttttgc ttttgcccat ccattngcgc atcggctgtc aggccgtcgg     480
agcttaatgt aatggaaaga atgtgcc                                         507
```

```
(2) INFORMATION FOR SEQ ID NO:252

     (i)  SEQUENCE CHARACTERISTICS:
          (A) LENGTH: 559 base pairs
          (B) TYPE: nucleic acid
          (C) STRANDEDNESS: double
          (D) TOPOLOGY: circular

    (ii)  MOLECULE TYPE: DNA (genomic)

   (iii)  HYPOTHETICAL: NO

    (iv)  ANTI-SENSE: UNKNOWN

    (vi)  ORIGINAL SOURCE:
          (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix)  FEATURE:
          (A) NAME/KEY: misc_feature
          (B) LOCATION 1...559

    (xi)  SEQUENCE DESCRIPTION: SEQ ID NO:252
```

```
tccgcatgca agacgagcag ggcttctatg atttcaagga ggcgattgtg tgcagcctta      60
tcctatgccg catttcacgg ttattgatga tcagacgcca ccctccgtat tgtctctcag     120
gtcgaacagc tgatcgaatg ccttattgcg ttatccatct tatcgatcca agcagataca     180
tttacggttt gtacgtggaa gcatgtttat cgcttcgcaa tacctccacc agcttgtaca     240
tcagccggtt ttgttccgat agctctttct attcaggtta ttatagggtt tgagagaata     300
aacagacgtc tcgctgcttc gcgatggtct tcttcgggtc tgtagtctct ccctggatac     360
agcctataaa attccgaaac gctttgctgc gacagcatcg agagcggtta ttttctccga     420
gtattcgctt gtcttgttca tgcaatacct tttttgaaag tagccagcac cttgtccagc     480
tcatccaaag aggaataatc tcatttttac tgaagagtgc gagcatcttt gacctcatca     540
tcataaaatt cagaagctc                                                  559
```

(2) INFORMATION FOR SEQ ID NO:253

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 4542 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...4542

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:253

```
tgctcgcaaa caaaaccaac tctattcgac actggagcag aaaggattca ccgcccctcc     60
actacgatgt ggacttatga cgatcatatc cgcgacgaat gaacaaagcc atgagcctac    120
tgcgcgaaaa agactacgac tccttcctgc agcatacaaa gagatggcta tcgttctgcg    180
tgacctgatg gaaaaaaaga gcttatcctt tatccaacct ctctgaagct catttccgac    240
aaagattcga agaaatgaaa catggcgatc gggaaatagg cttcttcctt atcgcatgcc    300
ggaattagat gcaccggcca agcaatcaaa agaagcccac ggcaatcatt tatggcagaa    360
ctgggagcct tacttgccaa acatggtatg ggacaggcgg acaagacgac aaggcgatac    420
tggatgtagc cgaaggaaag cgactttgga gcagatcaat ctgcttttcc gtcatctccc    480
tgtggatatt cgttcgtgga cgaaaacgag ctggtttgtt tctatacgga cacaaagcaa    540
gagtattccc cagaagcaag ggggtgatcg gccgagaagt acgcaactcc atccgcccaa    600
gagcgttcat atagtagagg agataaccga taagttcgac gtggcgaaca ggatcgcgca    660
gaattctgga tcaataagcc cggagtttca tctacattgt ctatgtggcc atcagagacg    720
ccgacgggcg tttcccggtg tgatggaaat gatgcaagac tgcacacgga tccgtagtct    780
tgaagctcgc gtacacttct tacttgggac gaagagcaaa gtccggcaca aggtcgaaag    840
aaagcgaatc cgatactgcc ggagaagacg gcattcggcc ggcacgaagc tgaagagtct    900
cttgcagcgg tatccgcaac tgatggatga ttgccaacga tcagttccaa gttcaccctc    960
cttcgttctc cgatggccaa gtaattcttc ctgttgccac cattaaaatg atgagcgaac   1020
gcgccgacat ccgtcggata tgctcatcgg caaactggaa tcgctcatcg cttcgtacat   1080
aaaccggatc gatcggaaga gaaatagcat gaagaaggag gtgtgtcata atcatggcgc   1140
acctccttgc attaatatgg gacggtcggg tacaccctat tccgagactc ctaaggagtc   1200
cctaccgaga cccctaagga gtctcaccaa gacccctaag gagtccttag ggg gttcctcaat   1260
aaggagtccc taccagaccc ctaagggtc ccaacagaga ctccttaggg gttcctcaat   1320
gcttacttca ggaggggttc gtgcggtctt ataatccatt cgaatggaga cacgggagca   1380
gtgaccggcg aaaggaagcc gaagcttagc gaatcttacc gcgaacagat tgatgatgcg   1440
gccggcacta cgtgcatcgt gctcggagtg gtcaccatga cgatggttgc accttcgcga   1500
ttgagacctc tgagcagttc atgacatcgg ctccgttttt ggagtcgagg ttacccgtgg   1560
gttcatcgcg aggatgagct tcggattggc caccacggca cgggcgatag ccacgcgtgc   1620
tgttgtcctc cggagagctg attggggaag tggccggccc ggtggcgatg ctcatcttgc   1680
gcagtgcctc ctccactcgc tctttccgct cggagccttc acacccagat agacgagcgg   1740
caactccacg ttctcgctta ccgtatctct tcgatgaggt tgaagctctg gaatacgaag   1800
ccgatattgc cctacggacg gcagtcctgt ctttttcccg gaggttgccc acttctgccc   1860
cacgagcttg tagataccgg aagtgggatt gtcgagaagg ccgaggatat tagcagagtg   1920
gacttaccgc atcccgaagg ccccattatg gcgataaatt gcctttgtcc actttgagcg   1980
atacgccatc gagggctacc gtctctattc ttctgttctg aaaaccttgg tgaggttgct   2040
gatttcaatc attgttttct tgttttttatg aggtgaaagg aagagcgaca agccggacaa   2100
tgcctggcta tgaatccgcc gtttgccgga ttgtcgccgt atttattcgt atcggattca   2160
ttgacagggt tgcggcgagc tatgcgccgg aggttgatga caacgccaat gcaataatca   2220
ggaggacgaa cagacctaca aggaggaaaa tccgccgttc aattcgattc gatagcttga   2280
acttctccag ccagttccga ccgagagata agcgacgaaa agtccggcaa gcacactcgg   2340
caggctgagc cgaaaatgga gcggaggaag agtcgcaaga tgtcgccctc tccggctccg   2400
tgatcttgcg aatggccagc tccttgcgac ggcgattgac ctccgtattc catagccgac   2460
cagcccgatc agagcgatca ggatagccac gacactgcca agaggatcgt attgcgaaaa   2520
gtcttggctg cctcgaagcg actgagaact ccatctccac accgaggaaa gaagtctcct   2580
tgtagggatc ggcttcgaga ggatgccatt cacgcgatgg aggagccggg catcgtcatg   2640
gcgaagcgga tcgtcagata atgcagccaa tcgtccccat agacgatggc ggaaggagct   2700
```

```
tttcggggta agggctcagg tgctgacggc ggagcatgag atcgcgtaca caccgcgaat    2760
caccactcgc ccgaaggaag tcaggatgat attttgccga tgacaccgtc tttccaattc    2820
atcagccgag ccaattcggt agcgctttct tgctgagcat gatctctctg tccttttcgg    2880
tggcagcgtc gagttttttcc cttcgagcaa ctcgatgtcg tagactttca gatagtgttc    2940
tccacgtaga agaggtcggc cacattgatc agctcacgat ccgtaacggg tcgataaggt    3000
tatctccact ctggccggaa gaagccggca aggcggtctc agcgtgtagc cttccacttc    3060
gggcagtgcc ttgagctttt cgatcacaca gggagttgct gctgatccag cgactcgatg    3120
gggacataat acagtcggcg gctttgtatc cggcatcctg ccctatcatg tgccggtatt    3180
gcagacggtg atagccaaaa ggccgaagag gaaagtggcc gccacaaatt ctacgccagc    3240
agtcccagct tccagagccg attgtgtgct accgacttgc gaagatattc atcaccggtg    3300
tacgggacag ggagtagccg gggatccatc cctgaagaaa gtagccatgg ccaatactcc    3360
ggccaaggct gcggctacgc gcacgagatc agatgcagca gcggagtttc gatcagagcc    3420
tccatcggct gcggaagagg ataagggtca ggagggccag cacgagagag aggaagagaa    3480
gaggaaggtc tcccagatca tcgtaccctg tatctgcacg ggcatggccc gtaacacttg    3540
cgaatggcag ctacacgccg gcggttgacc atggagggag ggtcatgagt acgtagttca    3600
gcagcgaaat aagcagcacc gctatgccac gatctgctgg attcgcagca tattgaccaa    3660
agtgggatct tccagcgcaa gcggttgaag ggcgtaaggg aatagtgcaa ttccactcct    3720
gcttgcggaa gacttccata tcctgatgcc gctttttgcat ctccaggaga gctcgtcgag    3780
gctctcgggc gacacaccgg gacgcagacg gacgtaggct attagcggtc gttgccgatc    3840
cagttgttca ggctctcggc cggcatccac gaatgggcag gagcatatcg gcttggatgc    3900
tgctgttgtg gggcagatcc cgaatacacc tccgatcgtg atggctcggt ccgatttgct    3960
ttctgccggc gcaaccgttt gcccaggaca tcgcccccca tcttccgggc caaactttgg    4020
agatgaggca ggtcatattg tcgcgcaagg cactatcccg gacgccgcga tgagttctac    4080
cccgaacatg tcgaggaaag ccggttcggc cagcaggtct tggtctcgta ggttttgttg    4140
tcttcgagta tcatcttcga ggtgcataca gagtcgttcg ggtagccagt tccacacccg    4200
gtatttcctc ctgatggcag gggcaacgcc tccgctgacc tgagagaagt cgagttcttc    4260
cggttatccc cctcctgact ttggcgcgtt ccatgcgtct tgacgatgca gagcgatcat    4320
gatgggggaa atcccgttcg tagcttcgct gatagatgac gtagagagca gaagcacgct    4380
gacggaaagt ccgagcgtaa gcgtcaggag ttgctgatac tgtgttcgcc ctgtcggaag    4440
agacggcgag cagcaagttg agaggtaaca tgatgtgcta tatgtcgttt aaggttgtta    4500
ttcgtttga ggtaatccac gggattggcg caggctgccc gc    4542
```

(2) INFORMATION FOR SEQ ID NO:254

      (i) SEQUENCE CHARACTERISTICS:
          (A) LENGTH: 826 base pairs
          (B) TYPE: nucleic acid
          (C) STRANDEDNESS: double
          (D) TOPOLOGY: circular

     (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

     (iv) ANTI-SENSE: UNKNOWN

     (vi) ORIGINAL SOURCE:
          (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

     (ix) FEATURE:
          (A) NAME/KEY: misc_feature
          (B) LOCATION 1...826

     (xi) SEQUENCE DESCRIPTION: SEQ ID NO:254

```
actgcactga aagactcgcc atacagatct cgtcccgatt ctttgggcga tacaatttcc    60
tgttcatgga gcatcagctc atcgtagtag tcgatcaagc ctcggccgac gcacctccac   120
ccgtatattg ggacatctgc aaaggtgtcc ggcagcatcc gacaggaagt agtagccatg   180
cgtactgtat gtattcccgt atgctccatg gtggtttttgg ccggattgta gaaccatgtc   240
accggcccac ggcataagaa atacagcgca tttgccctga cggagtaccg gtacggaggc   300
aaatcgtctg tcgtgatccg gctcagatct tcgggaagca ccctccacca taaccgaaca   360
cacctacctt ggacggatcg gagaagccat tgcacggagc tgttcgtccg taaggcgata   420
cactccactt gcatcgacac gatcttgacc caatgtcccg aagccattag cgaacggtcg   480
gccgtcttcc catagctcgt tgcgctttcg caggcaaagc aagggcaagg aagagagaag   540
gaatgcgact attggaagta ttcgtttcat ctgagaaata gcttatttat ggatatgtcg   600
agcagttttt gctcttcgag ataggcttcg aggtgctccc gatagcaatg gggcctaccc   660
ctgccggagt ccctgtaaag ataagacccc catacgaagt gtgaagaaac gactggcata   720
```

```
agcgatcaaa cgatcacgga aaagagcata tcccgtgtat tgccctgctg caccgtgcgt    780
nccgctatat ccaatcgcag gcccaattcc tgcacaccgt gcccgg                   826
```

(2) INFORMATION FOR SEQ ID NO:255

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 1466 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...1466

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:255

```
ccaagatgag atcaaaagca actatgcgga cacgaaaggc ggattggaaa gcagcgaatg    60
atatacgcga tcatcaagag gatcatcgac caaagtatcc acgcgaagta atcgacaaga   120
cggactttca atgggatccc ctgagcatat gctctacgac ccggccggca ctgctatccg   180
aggtcatgcc gaacccatac gcgatatgaa tatttcctgg ccaatttccg tgcgatgcaa   240
gcacagatgc atacatgccg catcagccga accagatcct gcgtgcattc gaggagagat   300
ggagattccg caagaagacg tcaaacagct attcgaaaca ctgtctcctc tccacaggta   360
aagaaggtgg ctcaactgat cagcaaacga ttggacgccc gttggagccg ttcgacatct   420
ggtacaacgg ctttcgctcg cgtcgggtat gccagagagc gaattggaca aaatcaccgc   480
agctaaatat ctacacccga agcactcaaa gccgatctgc cgaacatcct gcgcaagctg   540
gattcgaaag caaagatgcc gagcggatag cttctttggt gatggtggtc cttcgcgagg   600
tgccggccat gctgcaggct cgatgatgcg caatgacttg ctcgcctgcg cacacgtatc   660
gccgatacgg ggatggacta caaaggtaca atatagccgt acacgaattc ggacacaata   720
cggagcaaac catcagatga acgatgtgga ctactacatg ctcaacggtg tgccgaacac   780
atcctcaccg aagccgtcgc tttcctcttc cagaagcggg atctcgaact cctggtgtca   840
gcaagcccga tgcacagaag gagtacaacg aggctctgac cactttggga attgctacga   900
gatcatgggc gtatccctcg tagacatggc ctttgggaat ggatgtacac gcatcctgaa   960
gccgatgcac acgagctgaa ctcgcggtca tggacgcggc caaaaccgtt tggaacaagt  1020
actacgccgc attctcggag aaaaggacga gaccattctg ggcatctatt cgcatatgtc  1080
aattatccgc tctacctgcc caattatccg atggggcata tcatcgattt cagatcgaac  1140
agtacatcaa gggcaaatcc ttggccgtgg agctgagcgc atgctcgtac agggacgact  1200
ggtgccgcag tactggatga acaaccgtg ggttctccca tatcggtatt gcctatactc  1260
gaagccgtgg acgagccctt acgaaagtga aataatccgg cgactctccc tcctccttta  1320
gacagggagc tttaagggaa taattatcgt actgtacgga aaaagagag atgcacctcc  1380
aattctttaa tgattgtgag atgcgatctc tttttctatt ttttcgatac tttcagaaaa  1440
atcggttcta tcactctata aagttg                                        1466
```

(2) INFORMATION FOR SEQ ID NO:256

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 749 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
     (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
     (A) NAME/KEY: misc_feature
     (B) LOCATION 1...749

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:256

```
ggctcagtcc ggacaggaga aggccaaaga gggaggggct ttcgatcagc cattgtcaaa        60
gggcgaaagg ccatccacct gcacagtatt cgtaccaacc ggagcgtaag caaggttggc       120
agagcgatcc caaagccgta gctttccgaa caaaagagaa tacaaccgct ttctgcacaa       180
tgcctggatg ctcgtggcaa atcgcagttc tataatgccg atttcctgca ggcgcaggct       240
acatttctta tatcgcacgc ttatacagcg acgaaccgat aatccgcgat gaagccgtct       300
ttggcaggta cgctgctaca gtgagatggg gtggctgcat gaagggagcg tttgctcgag       360
cgcatcccta aagatcttcc gcatgtcgat cgagagggtt gtattctttg gcagtggcag       420
agcgttcgat cctgtcgggt gcaagcgcgc ggccatacct tatctccaac aggcagcaag       480
acaagagaaa acaagcgaca acgcgctcgt atgtattatc tgctcggaca gcttttacag       540
aaaacaatcg gccggaggag gctcgcaagg cctattccaa agtgttgcgg cttctccgcc       600
tttcgctttg gactttgccg cacggatcag gaagatgagc tggagggtga acggaatccc       660
cgtacagtag cccgctcgat tggaacgatg gccaacaaaa ggcaagttcc aaaggatgta       720
ttgggatcag atctttatgc aagcaggca                                         749
```

(2) INFORMATION FOR SEQ ID NO:257

     (i) SEQUENCE CHARACTERISTICS:
         (A) LENGTH: 566 base pairs
         (B) TYPE: nucleic acid
         (C) STRANDEDNESS: double
         (D) TOPOLOGY: circular

     (ii) MOLECULE TYPE: DNA (genomic).

     (iii) HYPOTHETICAL: NO

     (iv) ANTI-SENSE: UNKNOWN

     (vi) ORIGINAL SOURCE:
          (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

     (ix) FEATURE:
          (A) NAME/KEY: misc_feature
          (B) LOCATION 1...566

     (xi) SEQUENCE DESCRIPTION: SEQ ID NO:257

```
cgtgtctttc cattcagata aaatcaaaga ggcgaaagag gatttggctg cttcgagaaa        60
cgagtggaac gggatgcaga gggacttcca atcaacaact cacaattaag ggtgtagaag       120
gaagtacgga catcaaggtt attgctgtcg cttgcaggag atcgaggaga aagcacgcac       180
caagggtgaa tacaataaat cggtgagatt tatggctttt ccatcatggt caagacggaa       240
aactctcaaa gagttgttcg actgctcctc caaccgcttt tcgtgaaagg gcanagagca       300
tctactatac ctacaataac gggaagttgg cttctgatcc caacttgctt gtcagaactt       360
tatcaatgct ctcgagcgta ttccaaaggt gatgaatcac accgagaaag ataaggaaaa       420
ggtttctgca aacaaggagg ttatatgacc attgcgggtg ggtcgtggaa gaaagaggac       480
gagcttcgct tctcaaagga caggcagccc gaactgggat agaaaaattg cactcacgcc       540
gcacctcccg gaggaagaga aagaaa                                            566
```

(2) INFORMATION FOR SEQ ID NO:258

     (i) SEQUENCE CHARACTERISTICS:
         (A) LENGTH: 1212 base pairs
         (B) TYPE: nucleic acid
         (C) STRANDEDNESS: double
         (D) TOPOLOGY: circular

     (ii) MOLECULE TYPE: DNA (genomic)

(iii) HYPOTHETICAL: NO

(iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
    (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...1212

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:258

```
tcagaagaga attttatcta tctctatttg caaaagaaaa agccaacatt atagaagaag      60
aaaatttgat attttggact aaaggatttg ttgcaggcta aataaagact ttataagtgc     120
atctcatatc ctaatgccat atttagacat gcgttgcgta atattgctga aatcaagaaa     180
ggaaacataa ctacttagag aaaaaacgac aagaggctcc ttctttaggt gtaattttcc     240
ctatgttcaa ggtgtaattg aagaagaaat actgtatgaa atagaatcct ttctaatcat     300
gggatagatg tcaattttag gaataattta tctcatggac ttcaacccct tttgaaattg     360
aaaaatatgg gatttatttg tggtggatat gctaaaacta tattttgaag aaaagaatat     420
gataaaaatc gctccctaaa ttataaaaga gataaagaat tactagcctt acggcctctg     480
cgaggctttt aaaaccagat gaaagtgaat aactttgcat tttggcatca aaattcttgt     540
gaatccaccc taagtgtgca aaatatctct gtaatcttat ccttggtatc atatggtgtg     600
taattcgtta tttttcaaga ccaaaacaca caaagtaccc tgtaattccc aacttctata     660
agactttct tatcctgaac tcacgtattc tttaatgcga agcaaagtt gtccgaaaga      720
aattttgttt ccgtaataaa agattcctgc aaagctgcat agtcgttctt ccaatccttt     780
atacttctac aggaggataa aactctattt ttccggataa tctttatcac agtagcatag     840
agaaccggac ttacaagacc gaaaagcgta tatactccga atcatcgaca gaaatacaaa     900
aacaagtcgt cattttccac cgataagaac gcattttaca aagaacaggg acgagcctgc     960
catttttgccg gggacgacgt tcgttccggt taggacgacc ctccgtctgt tttaggtcga    1020
cctgacttt gtcagggtcg gcgtgtgtgg tttattgtct cgtaatgtgc aggtaagaga    1080
gggttaagag tcgatatttc gggaacggat aatctttccg gatttcgcct cggnatgcgt    1140
tccgatatat aatctcccng gggatggcat gacnggcaac agtcttctga aaaccgcatc    1200
atctctgcgc tt                                                        1212
```

(2) INFORMATION FOR SEQ ID NO:259

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 477 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...477

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:259

```
ggccgaactc gtagaaaacc ccctctatct gggttgtctc attgtaaagg tggagatgcc      60
gatggactga ttgccggcgc acagaatact accggcgagt acttcgtccg gctcttcaag     120
tcatcaagac agctccgggc atgactacgt gagcggtact ttcttactct tcaccaaagc     180
caaagaatat ggcaaaacgg acttttgctt gttgcagact gtgctgttat acccaatccg     240
acagcgatga gttggcacag atcgctgtcg ctacggctcg tacggcgaaa gccatgccga     300
tattgaaccg cgtgtagcta tgttgagctt ctctacgaaa ggcgtgcaaa acatgaaatg     360
acagataagg tcgtagaagc tactcgtatg gccaagaaat ggctcctgat ttgntgatcg     420
atggcgaaat gcaagcccga tcagctttgg tagaaagagt ggcagcactc aaagctc        477
```

(2) INFORMATION FOR SEQ ID NO:260

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 544 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...544

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:260

```
gatcgcagga tcagattatc cccgtgaagt tgagtgattt aagacggata caaaagagtt    60
tatcgccaac cccacgaatc gtgccgatct tcccgagagg aaaagcgcga ggtagtaggg   120
cttggtacca tggaactggt tacttctctt atgctatttc gatcaaaaat cagatcgaga   180
ccagctatca gatgtaatca gtgtacaaaa tgaactcatt gctgcatata acgaagtttg   240
ggacgatttg ctcaaaagta tttccacaaa ccatacaagg agcttactcc ttccagcaga   300
aggctgtttt agaagcatat ccgntgcaca tttcagaaat gccttgtcta atctcaagta   360
aagaataagg aacaaaatgg gaaagtttaa taatccggcg ggcgtgaaat gcccgaactc   420
aatacctcgt ctttgcctga ctggtttttg cgttcctctt ctttatcatg atggtaacga   480
caattcgtga gtgacgccca aggtgtcgta taataacctn cctaaagcga ctgaattgac   540
aagc                                                               544
```

(2) INFORMATION FOR SEQ ID NO:261

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 5293 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...5293

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:261

```
gcaaaaaact gcagagaaag ttaggcccta tctccatagc cactccggag ctctcttgaa    60
tgcgcatgaa atgctgagag acaagatgca ctacttcacg agcagacgca atgcagtgtg   120
ggtattttta ttcatcgtgg attcaagatg cgggtaaggt cttgctcctg atggagaatg   180
aaggtgacga agaactctcg cttatgctcg ttcgttggct cgcaacaatg gcagtgtgct   240
cgatgactac ccgagaccga tggtttaccg ccgactctat ccatgggaga aaacgactga   300
aagccggatt gccatcgaca atcaatatca gcagctacca cttatgctcg tcagctaccg   360
ctattggttg cgctttgccg gtgagtgtcc gatgtgatcg agcacttgcc ctctaccatc   420
attatccatc atcgaaatga cgctcttcga cattgaaagc tgcaatgata tgagaataat   480
```

```
cgaacaagat cttggctgcg cccatatgaa tcagtaatag aaagcagact gaagtatgcc  540
gcaaacgaga gacggatttg accggaggaa gatccggagg attgagcgct cgccaatgg   600
acatctctat tacggtcttc atcaggacgg ggattcgggg tgattcgtga gttcgcgccc  660
gaagccacgg ccgtatatct gatcgggaac tttcgcgctg gcgtagattg ccacagtttc  720
ggtttgcgcc tgtggtgaag cgggttcatg ggaattgcga cttttcatgcc gactgcttcc  780
gcatgctctc gctacaggct cttcttcgaa tggcccggtg gcgaaggaga gagataccgg  840
cttggtgcaa ccgtgtagaa caggatcctg aaacttatct ttctacgccc aagtgtgggt  900
gccggatact ccctatgaaa tgaaacaccc tatcctaacc gtaaggacga gcctttgcta  960
atttatgaat gtcatatcgg atgtcgtccg aggaggagaa ggtcagcaca tacgaagagt  1020
ttcgacggat atcctccccc gtatctgcaa ggacggctat aatgccatac agctcatgcg  1080
atacaggagc atccttatta cgcgtcgttc ggctatcatg tgtcgagttc tttgctccga  1140
gcagtcgttt tggaacgccc gaagatctca agcgtcgatt gatgaagccc acgctctcgg  1200
cctctacgtg atcatggatc tggtgattcg catgcagtca agaacgaggt cgaaggcttg  1260
ggcttgtatg acggacgcat acccttttct tccatgacgg caatcgcgga ctccatccgg  1320
cttggattcg tattgcttcg actatggtag ggacaacgta ctgcacttcc tctttccaac  1380
tgcaaatact ggctgacaga gtttggattc gacggcttcc gttcgatggt gtgacgtcca  1440
tgctatacta tagtcatgga ctcggcgata gttcgacaat tacgacagct attacaacgg  1500
ccatcaggac ggcgatgctt tgcctatctg atcttggcca acaaactcat tcacgaactt  1560
tgccccgagc aatcacgata gccgaagagg taagcggcat gcccggatta gctcttcctt  1620
ggcagatggg ggatatggct ttgactaccg tttagccatg aatatcccga tttctggatc  1680
aagctcatca aagagcatcg tgacgaagac ctatgccgag agtcacgatc aggctttggt  1740
ccaatcgccg tcaggaggaa aagagatcag ctatgccgag agtcacgatc aggctttggt  1800
cggggacaag acatcatatt tcgcctgatc gatgccgata tgtattggta tatgaacaag  1860
caagttgtgt acatagcgtg dacagaggca ttgcactgct gaagatgatc ctctcttcac  1920
tgccacgacg atgaatggtg gttatctcaa tttcatgggc atgaattcgg acatcccgag  1980
tggatagact tccctcgcga agggaatggt ggtcgtacaa gtatgcccgc aggcagtgga  2040
gtctggccga tagtccttct tgcgctatgc aggtctgcac ttgtttgatc aggatatgat  2100
agccatgtac gatcggtgga gagctttcac aaactccctt tgcgcgaata ctggctaaga  2160
gagaagagca ggtgatctgt tacggtcgag gcgatttctt cttcgtttca attttcaccc  2220
cgaacgttct tattcggatt atcccatccc tcttcggccg gtaagtattc ggtagcgatg  2280
agtaccgatg cacggaagta cgaggtttcg gtcgtgtgga cgaatgggtg gagcacttta  2340
ctcttccgga tggagtaaag atcggtttac ccatgaacag tatttgaacc tctatctgcc  2400
gctcgctctg ctctcgtcct gaagcttgcc gaatgacagc ttccccttcc ttttttcaaa  2460
tccccccctct aactaagatt cgatatgacc gagcgacttt ccttcttgat gcttatgctc  2520
tcatctttcg tgcctattat gctttcatcg tagtccgcgg atcgactcta ccggtcgtga  2580
caccggagct gtattcgctt ttgccctgac cttattggat atactggaga aggagtcgcc  2640
ggagcaatcg ccgtggtatt cgatcctccg ggaggtagtt ttcgtcatcg cgagttgcag  2700
agtacaaggc tcaacgagag gaaacgccgg aaggtattcg catcccgttc cgttgattaa  2760
agagatattg gcagctttcc gtattcctgc tgtgaagtgc cggactttga agcagacgac  2820
acgataggta ctttggccaa acagccgaag agcaagggct tgccgtcaga atggtaacgc  2880
ccgataagga ttcggccaac tggtgtcgga gcgaatcaag atctatcgac ccaagtcggg  2940
ggtggctatg aaacatgggg gccggcagaa gtctgcgaaa agttcggact tccatccccg  3000
ggcaaatgat agattacctc ggcctcgtgg gagacagccg gacaatatac ccggatgtaa  3060
aggcattgga gcgaaaacag ctgagaacta ctggccaagaa aattcaggag ggggaagagc  3120
tacgcccacc aagatgattg aaaggagctg tggccaagaa aattcaggag ggggaagagc  3180
aaacggcttc tcgcgctact tggccactat ccgcacggat gctcctattg tcttgattcc  3240
gaagcctatc gacgtacttc gcccgatatg gcagccgttc gtgatgcttt gctgcactgg  3300
aatttcgcac tttgctgaaa cggttggaga gtcacctacc gatgcccctg cgacagacct  3360
gtttgccggc atggtacagg ccaagagcct ccgacagatt tgttcggaga aggcaccgat  3420
gctacaggac tccgctaaag aaactgacag acgtaccaca cgaatatacg attctcaaac  3480
cgaggaagag atagcggatt gcatccgaat gttctctgcc acgccttgtt ctcattcgac  3540
acagagaccg actcgaaaga tgcacttcgg gccaatacgt tgccatcacg ctatgtgccg  3600
agtcgggacg ggctttcttc ataccgtgcc ggaagacgaa gaaatcggaa aacgcagatt  3660
agatctcttg cgtccttttt tgccgataca gctatcggca aagtcggtca gaatatgaag  3720
tatgtatcca agtactctcc cgatatggta tagaagtacg cggacagcta ttcatacgat  3780
gatagcacac tacctcctct ttcccgatct ccgccacaat atgatgagat ggcggagacg  3840
ttgctgggct attgcaccgt ccactactcg gtcttgtcgg aagcgacaaa caggaggtgc  3900
acatccgtca ggtaccattg agaatctggc agactatgcc atggaagacg ccgatattac  3960
ttggcagctt atgaacgcct caatgctatg ctctccgagg ccgggatgac ctccttatcg  4020
aaagtataga gatgccactc gtgccggtgc ttgccaatat ggaacgcccg gcgtaaagct  4080
ggacacggag gtgctccgac gcacagcttc cggactggcg aagagatgca gcgaatcgaa  4140
gatgaaatct accgtttggc cggacctcat tcaatatcaa cagtccctct caagtgggaa  4200
ccgtgctctt cgagaactgc aaattaccga aaagcccaaa aagacgaagt ccggcagcta  4260
ctcacaaacg aagaaattct ggtcaagcta caggaaaaac atcccatcgt gctctcatac  4320
tggactatag aggaatcaaa aaactactca gtacctatgt aaagctctgc cggagatgcg  4380
ctaccccgat ggtaagctgc atacctcgtt aatcagaccg tcgctaccac gggacgtctc  4440
tccagcagca atcctaatcg caaaacattc cgatccggac cgaagtcggg aggggctga   4500
gggctgcttc gtaccggaca atgacgaatg tattttcatg agcgcagact attctcaatc  4560
```

```
gagctgcggc tgatggcgca tctgagtgaa gacgagagct tgatacggct tttctccatg    4620
gggaagacat ccaccgagcc acagcctcca aaataacagg ctgcctcttg tagaagtcac    4680
ggatgacatg cgccgccgag ctaaacggcc aacttcggga tcatctacgg catctctgct    4740
ttcgggctta gcgacggctc aatatctccc gtacagaagc caaggccttg atcgaaggtt    4800
acttgcctct tacccggggg ttaaagcgta tatggatcgg agtattgccg agccaagcga    4860
cagggctacg tcaccacact gttcggtcgc aagcgattcc ccgggatata aacagtgcca    4920
atgccgtcgt ccgcggctat gcagagcgga tgccatcaat gcccctatac aaggctctgc    4980
tgccgacctg atcaagctgc gatgatcaga atacacgagg aaatcactga gcgtaagctg    5040
cggagccaat gatcctgcaa gtgcacgacg aactcaactt caacgttctt cgtcctaagc    5100
tgcagaagtt cgcgagcttg tacgctcgtg tatggagggg gtgatccctc tttgcgtgtt    5160
cctctgatag ccgagatcgg cgaaggagcc aattgctgga ggcgcactga cgccattttc    5220
cacctgacat aatcccgaat agtccatgga cagttgtata aaaacgaaaa tcacagcgaa    5280
ttgaggttcg gga                                                       5293
```

(2) INFORMATION FOR SEQ ID NO:262

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 814 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...814

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:262

```
gccagttcgt tttccaactg attgcgcact tcatttgctt tccgctgact tcgtaaacgt      60
ttttgcgtaa ctcttcctcg ctttcacggt gacaggtcga caggtgcggt ccatgtgtgc     120
caaaggactc gtgatgtgat gatcactaac ttcactcctc cttcgcttat gtatggcata     180
tggcaatcgg cgcacgcaca cctcgctggg catggattcc gtgttgagag atctcgaagt     240
ccggagctgt gctttcacaa tggggcgcg gctcagggtg tgaatataat cgtatactca     300
gcttcatcgt aatatcgttc tgcatcctcc attgtcattc cttatcccat gggaaagtag     360
ggtatttgcc ttctccctta aagtagtatt cccatgacat tgggcgcata cgagtgagcg     420
catctcctga tgtgaagcct tgttatatcc agcccacgtc tttgaaaagc ttcgataagc     480
gcggggcggg gatgtgcaga tccatcgttt ccggatcatg gcagtctgca caccctatcg     540
attcactatg tcactgccca gactgctcca tttgtttta tagaattctc tactccaatg     600
gcttgcatca tgcgtggcac atcgggactc ttacatacca gcacgtggca ggctgcatgt     660
ctcctgcccc atcgattccc ggattccggt tcgcagggta cgctgcatat cctgtatagc     720
atgcatatga ccgcgggaga tgtataatct ctggagaagg catagccggc ccagaatata     780
accagttggg acgttgttcc aatacgtcta ttgc                                 814
```

(2) INFORMATION FOR SEQ ID NO:263

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 608 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
    (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...608

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:263

```
gggcaaaaaa cggatctttc tcctacaaca tcttcgtata acaagtatac tgaaagctga      60
tgttatctac tgaacacttc ctcctctttg cttctatttc ctatttgcag gtattatggc     120
cggaaaggtg ggctatcgtt tcggtatcct acccttttga tctttctctt caccggtatg     180
ctcttcggag tggatgattc ggttttcagt tttctaaatg cccgatgtgg gcacaagtcg     240
gtaggatcat cgctctctcc attattctct tcaccggtgg tatggatacg cggacagaaa     300
ggtgcgtccg gtcattgccc agggacttac gctgtctact ttggtgtctt gctgacagct     360
cttctatccg ggttctttat cttttggctg agggttcgga ctttggccct tacccgttcg     420
ctctttctac ctctttgctg cggctgccac gatggccagt acncgactcg gcttcggtat     480
tcgccatcct cgttcgcaaa agatgcagct caaagagaat ctggctcccg acactggagt     540
ggagagcggt agtaacgacc cccatggcgt atatgctgac catcgcacca tcgatttcat     600
caccaccg                                                              608
```

(2) INFORMATION FOR SEQ ID NO:264

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 475 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...475

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:264

```
gagctggtct tcgatacggt catccagcgc aacatcaaac taagcgaggc cccagccacg      60
gtattccggc actgctctac gatgccgata gccgcggacg gtcaatcata tgcagctggc     120
ggccgagctg atcaaaaagc acaaacaaaa ggagcctgac tctcatatga agcatacgaa     180
gaaaacgctc ggtcgtgcct ggactccctc ctcgatgcgg aggtcatagg gtcttcttcc     240
atcaggaagt ggccatcagc gatatatacc ccaatcccga tcaaccgcgc cggatttcga     300
ggaggagtcc ctgaaagaac tggccgcttc gctccgttcg atagattggt acagcccatc     360
acactactga agaagtccgn cggcgactat atatcatctn cggagaacgc cgcttggcgt     420
gcggcccgaa tggccggtat gccaccctgn cggcatacat caagacggaa gagga          475
```

(2) INFORMATION FOR SEQ ID NO:265

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 729 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
    (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...729

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:265

```
cgaagaagat ctgcaagccg gcgaggacta ccaatatgcc gtggagggcg caggctcgtc    60
atggaacggc agcggcagga ttcgctctac agggggatca ggtgcggcag atggaggaga   120
gcctccataa tatgcgtcgc aatctgggat ggtgcgcgcc cgtgtggaag acctgaacgt   180
gaaggcaccg gccgacgtca gttggggctt ttggacgtgg agatagggca gacggtagga   240
gccggagtcg catcggacag atcaacgtcc tgtccgacta caaggtggag gctagataga   300
cgagcactat atcgatcggg tcaaagccgg tctggccgct tcgtcgaacg gcagggcagg   360
gacttctccc ttcgcgttcg gaaggtatac ccgaagttcg ggacaagcag ttccgcaccg   420
acttcatatt cgacggagag cacccgacaa tatccgcaca ggccaaactt actacatcaa   480
tctgcgcctc gacagccgtc cgaagccatc atgatcccgc gcggagcctt ctatcagaaa   540
ccggcggacg atggatattc gtcgttacgc ccgacggcaa gcgagccgtc gccgggacat   600
cacgattgcc cgtcagaatc cgcagtatta cgaagttcct ccggcctgca ttgccgncga   660
gatggtcatc acctttcgta tgatattccg cgatgcataa gaaattatcc tgaatgaccc   720
acctatagc                                                           729
```

(2) INFORMATION FOR SEQ ID NO:266

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 710 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...710

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:266

```
gcgtcgggca tttatcaaac ggcttctaaa aacacagact gatatggcgc ggcagtagcc    60
gatagcagta ttttttgaga aagcgaccgg aaagggaaga acttttttggc cgctttttccg   120
ttttttataag caagtagaac aagaataact caaacgaaac aagatgaaaa agaacatttg   180
ctcgaaagcc attctctggc ttctctgctc ctcctctcag tcgggacaat gactgcatcc   240
tgtactccaa gaatgacact cgtcaagaag aaaccgtctc tgccgatagc aaggagagaa   300
agatggcaaa atcatccata tcacggctga atacatgcgc gaaacatata tgattacaca   360
gccaatcccc aagaatgggt ctataaaggt gaaagcctgc tattatcgac ttctatgccg   420
actggtgtgg cccgtgccgc acctttcgcc caaattggaa gaggtggcca agaaatatgc   480
cggtaaactc ccgtctacaa agtcgatgtg gacaaagaaa aagagttggc agggattttg   540
gtgtcagaag tattccgatg gttctttttcg taccggtaaa aggaatacga cgcaaacgat   600
gggcaatctg ccgatggaga acatcgaaga ggctatccca aatcatgcaa tctgatctat   660
aggtcaaatt gcagactgta atatactaca ggccaataac actacttgag                 710
```

(2) INFORMATION FOR SEQ ID NO:267

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 878 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double

        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...878

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:267

```
gccgtgtaag cgcaataggg tcaagcgttt ggtcagggag gcttatcggt caacaaacac      60
ctcctgaacg atgtcctcca agagagacag atctatgcac tattgcattt atggtagtat     120
cggatgaact tcctgacttt cgtacaggga gagagcgatg caaaagagtc tgatcagaat     180
tgccggaaat gtacctcatc ggctttgaaa aacgagtaaa tacgatgcga ctgatcaagg     240
ctttttcgtg caactcttac tgctccccat tttcttctac aagcggttta tatcccgctt     300
acaccgcctt catgccggtt tacccctca tgttcgtcct atgcatcgaa gccttacgta     360
aatatggccc gggcaaagga ctattgctga gctcaagcgt attctccgct gtcacccgtg     420
gggtggaagt ggctatgacc cgttccgtaa gaagttttct tcacttaatt cctcttatat     480
ggtatttctc acattcatac tcattctgca gctcgcaacg atagcgagat cattcgagtc     540
ggaatctacg accgaatgaa accatatctc cgaatacttt ttgctccacg gcattcatcc     600
gtggagtgta ccagagaatt atagcggaga gttgcttctg tccgtgaagg attgaatcac     660
gacgaggttg ttgctctggg agaatggggc tggataaggt gtgcagtaca ccgtatgaaa     720
agcaacgaaa agcttcctcg atcaaattga tctgagcgaa gagtttggca tgccggtgct     780
actgacatag tacgagcatg ggatgatctt ttggcgatca aaaacaggta aagcttcaca     840
gcccgtggat cgttcatggt ttcggagtag tgaaaaac                            878
```

(2) INFORMATION FOR SEQ ID NO:268

        (i) SEQUENCE CHARACTERISTICS:
            (A) LENGTH: 570 base pairs
            (B) TYPE: nucleic acid
            (C) STRANDEDNESS: double
            (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...570

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:268

```
agaagataaa gacttcggcc catgccaaag aattggcaga gaagtttgca agaaagaagg      60
ccgtcagccg cgtatcatga tcgccaaaat ggggcaggcg ggcatgaccg tggtgccaaa     120
gtggtcgcta ccggctatgc cgactgcgat tcgacgtcga tatggggcct ctgttccaaa     180
caccggaaga agccgccgtc aagctgtgga aaacgacgtc cacgtgatgg gcgtttcctc     240
tctggagccg gtcacaagac gctgatccct caggtaatag cagagctgga gaagtcggcc     300
gtccggatat tctggtgaca gccggaggtg ttataccggc gcagattacg acttcctcta     360
tcaggccggt gtcgctgcca tcttcggccc cgtacccccg tggcctactc ggcagccaaa     420
gtgcttgaga ttcttttgga aaataatctc tactctcgat aaggagtatt tcagcattct     480
ctgtatggcc ctcatatgat tcctcgaaag ggagtcgtat gagtggcttt tttatgttca     540
agtcattagt gtcctaaaag tttcttcttg                                     570
```

(2) INFORMATION FOR SEQ ID NO:269

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 453 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

   (ii) MOLECULE TYPE: DNA (genomic)

  (iii) HYPOTHETICAL: NO

   (iv) ANTI-SENSE: UNKNOWN

   (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

   (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...453

   (xi) SEQUENCE DESCRIPTION: SEQ ID NO:269

```
ccgatgccgc tacctccggt tttggtcgta tagaaaggaa caaacatatg tcgaacacct      60
cttgaggaat aggagtgcca ttgttctcca catgaagggt agtctgtgtt catccaacga     120
atcgagacgt tcctcgacac gaatacgaaa agtcgtttct ccgtatcggc aggatattcc     180
gcctcggcag cattttgacg aggtttatca gtaccgaagt caattgccgg cggtcggccg     240
ggacatcagc tccacgggta tttcttcaat atccaccttt atatcgttgg aggaagaagc     300
tcttcttgca ggcgcaatat ccccgaaaga aaagcatgta aagaatgtcc tccttctcgg     360
gaggaggaac tgccgtaaac ttacggtagt ccgtacaaag gataacagcc ccactccggt     420
actacgaatg gtatccaatc cgtagacagc atc                                  453
```

(2) INFORMATION FOR SEQ ID NO:270

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 988 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

   (ii) MOLECULE TYPE: DNA (genomic)

  (iii) HYPOTHETICAL: NO

   (iv) ANTI-SENSE: UNKNOWN

   (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

   (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...988

   (xi) SEQUENCE DESCRIPTION: SEQ ID NO:270

```
ggcggccttc taccaaatag cacaggcttt cagagggagc cgaagcctct agccattcct      60
tcttttgccg aatatgagga tgcttgtcgg atgtacgaca cgaagtctgc ttctatcctt     120
ctaatgagga cataggcgag gctgattttc caatatggat ttctgctggc tttgtaaccc     180
gaacaatccc gatggcgact gctgcagcgg acagagatcc tgcgtctgct caacgatcat     240
cctgaacgac attcgtcctc gaccagtcct atgtatcgtt tacgaccgag gaaggattcg     300
tccggccgac atcaaaggac ggaaaaacct tgtcatggtc tatctttcag tcatgcctat     360
gggataccgg ggcttcgcat cggctatatc gtgccaataa agattttatg aagcgtgtgg     420
cggctttcag tacgccgtgg gggtaaacgc actggctata gaggctgcca aattcatcct     480
tatccatcct cacaattcac tctgccgatc cgcaagtggc aacgcaatac ggtagattta     540
tcacagccct gaatcgcctc gatggtgtag aagtacatcc ctcaggcaca cgttcttcct     600
ccttcgcctc aagaaaggaa cagcggccga actgaaaaat atatgctgga ggaatataat     660·
```

```
atgctgattc gggatgcttc caatttcgtg gtctcgatga atcctacgtc cgaatcacca    720
cgcagcgacc tgctcgaacc agcttttcat caaagctctg gagacattcc tcgagaaata    780
ctaaaatagc agatgctgca gatcagtctc tgtccttctc ctgtactcta tcctattaca    840
agacggagca agaagagtac acggtgttat cgtggatatc ttcgtgccgg taccaccatc    900
acaacggcac tgatgaacgg tgccgtagca tatccgatgc accgttgaga gcggaaatct    960
atgccgggaa cggttcttcg agagcgag                                       988
```

(2) INFORMATION FOR SEQ ID NO:271

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 568 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...568

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:271

```
ggccaaatta ccttccagtt catccggacg gggactgatt tggctaagtc ctcccctacc    60
gacgatgaaa tcgacctgct gaccaaggcc ctccgacggc cggttctttc agcgtggagc   120
ctgtattgga tgtccgtcag gactgggggc cgagttttat tcgaatggaa aaggcgagct   180
ttacttcgtt ggatggctcg tttcgatact aacaggtggg gagcctatct gggcaatcga   240
cttgcaccca aaccgatttg gttgccgaac tgacccaaac ggtcggggca caagacatga   300
agaggctatt gcatctgtga aagattatct acgagaacgc ttccctcact gtacaccggc   360
tatatcggag tagacatggc agtatatgcc gaagagacag tctgtttctg catccttgta   420
tcgagatcaa tgtacgatac aaatgggggt ggcagctatc ctgctttacg acctttggat   480
agagaaaggt gaagaggtgt gttcgaagtt aagggttttc gaaccgaagg cgaancacag   540
aatgggattc aatgatgcag tgcagcca                                       568
```

(2) INFORMATION FOR SEQ ID NO:272

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 1057 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...1057

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:272

```
agattaataa ttgctggtga ttacttcagg attatcttgt tcgttgcaga tcgggaaata    60
ctacagcagg cttgaacacn tgggcttcct ccatcgggat ccaggcatat gccatgatga   120
```

```
tgatgatgtc gcccggatga acgatgcggc agctgctcca ttgagacaga ttaccccccga    180
acctcttttg cccggttggt ataggtctcc aagcgtgctc cgttgttgtt gtccacgatt    240
tggacttctc tccggcgatg atgttggcag catccatcag atcttcatcg atgggatgct    300
acccacatag ttgaggttgg cctccgtaat ggttacgcgg tgtttttgga ttttaatact    360
tcgacgtaca tgttgttttc caattctcta tatttttacg attgcaaagt aacttaaaat    420
cgctgtaata ttcgcataaa acggcagttt aacgcaattg ggcttgatta ttaaggacat    480
acggcgcaaa tgcagaaaat ccgccacctg ccacgaggca gtaatatgcg gattattgca    540
cagaaaggtt ttcaaatcgt tacccgaaag caaggtaatc acctccgtaa agaggagaaa    600
aacagcggtt ttccgtgcat ccgttgctgt tgctctatgc tctatatttt gcatagcagg    660
gttaggctct ttcatgttta attttgaacc aaaaagaaaa gacaatggca agaagcacat    720
tcaaggtgct gttcttgtga atggcagcaa ggagaaagaa ggtatcgtcc ccatcatggg    780
acggttacaa tcaacggcac ggtggctcag ttcagttgca agcgcaccat cccaaggagt    840
tgtgggatgt gaaaggcaac agggcgaaag gcaagagcag ggagccatcg ccaccaacct    900
ctcgctcgac aacatcaagg cgcaaatcat cagcactatc agcgtctttc cgaccgcgag    960
gcgttcgtca cggcggagat gtgcgcaatg cctatcaggg gctgggcagt gagtacgata   1020
ccctgctgag cgttcgacag ggaatgcgcc tctctgc                            1057
```

(2) INFORMATION FOR SEQ ID NO:273

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 924 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...924

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:273

```
ggcttggaga gccgtttcga agagatttcc acgcttatca cggatccggc gtaatcgcgg     60
acatgaagcg tttcacgaag ttgagcaagg agtatcgcat ctggaaaaga tccatacggc    120
cgggcgcgac tatcgcaatc tgctcgcaac atcgaggaag caaagcatac catggccaaa    180
gagagcgacg aggagtgcgc gagatggctc gcgagatgct ggccgaggct aacgaacgct    240
tgcccttttg gaggaggaga tcaagatgct actcattccg gccaatccgg aggagacaag    300
aatgccatcg tggaaattcg cggaggaacg gggggcgatg aggtgcactt tttgccggcg    360
acctctaccg catgtacgtc aagtattgcg aggcaaaggc tggcaggtgg aggtcaccga    420
cctgagcgaa ggagctacgg gggttacaaa gagatcgtct tctcggtcaa gggggaagga    480
gtgtatggta cctgaaatat gagagcggtg tgcaccgtgt ccagcgcgta cctgcgacca    540
gacacagggg cgcatacata cctcggcagc taccgtggct gtcttgccga agccgaagaa    600
gtggacgtgg agatcaatcc ggcagacatc gagatgcgac gtcccgttca ggcggtgccg    660
gaggtcagaa tgtaaacaag gtggagctaa ggtgcagctt acgcacaagc ctacgggtat    720
ggtggtggtt tgccacaggc tcgttcgcag attgccaacc gcgaactggc tatgcaaatg    780
ctgcctccaa gctctacgac atagagctgt ccaagcataa cgaagctatt gcacccgacg    840
caagacgatg gtatcgaccg gcgaccgttc ggccaagatt cgacctacaa ctatccgcaa    900
ggacgggtga cggatcaccg catc                                          924
```

(2) INFORMATION FOR SEQ ID NO:274

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 1347 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

(iii) HYPOTHETICAL: NO

(iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
    (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...1347

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:274

```
attccggngg actatcacga gaaagaaggt aagagtgctc tcgaagtggt tngaccgtat    60
tgcatgccgg aggtaagttt gacaagggtt catacaaatc tcgggcggtt tgcatggagt   120
gggcgtttct tgtgtgaatg cactttcaca tatttgcgtg cagaggtgta tcgtaatggg   180
aagatccata tgcagggttc agctgtggca aacccttgca tgatgtggag gtgataggct   240
ccacgagcgt acggggacga ctattcagtt caaaccggat agctctatct tctcgttacg   300
gaataccaat actccatact ggccaagcgt ctccgcgaac tttttatctg aatgcgggga   360
ttacacttac gctgacggat aaacgaacgc tcaggaagac ggcagtggct acaagcaaga   420
tgtattccgt tcggaagaag gttgaaggag tttgtccgtc atcttgaccg tatgaaagaa   480
ccggctggtg acaaacgtta tccataatcg tcaccgagaa gcagggcatt cccgtgggag   540
tagcatngac gtataatact tcctatctgg agaatgtata tagctacgca atgacatcaa   600
tacgatcgag ggcggtacgc atttggccgg attccgtgtg gacttactcg aactttgaag   660
aaatatgcca cagactccaa actcctgata aggtgaaggt ggagatcacc ggcgacgact   720
tccgcgaggg attgatgccg tgatcagcat caaagtggcc gaacctcagt tcgaaggaca   780
gaccagacca agctcggtaa caatgaagtg accggtgctg tcgatatggc tgtagcgaag   840
cactcgaata ctatctggag gagcatccga aagaagccaa acgatcgtgg acaaagtcgt   900
tttggcggca actgctcgtc aggcagcccg taggcccgcg aaatggtgca gcgcaaatcg   960
cccttgtccg gtggaggatt ccgggtaagc ttgccgactg ctcgtccaaa gacccggagc  1020
agtgcgaacc ttccttgtcg agggtgattc ggccggcgga acggccaagc aggggcgcac  1080
cgcgagtttc aggctatcct gccactgagg ggaaagatcc tcaatgtgag aaagccatgc  1140
aacacaaggt attcgaaagc gaagaaatcc gcaacaatat accgctttgg gtgtgacgat  1200
cggaacggaa gaggacagca aagccttaac cttttccaaac ttcgctatca taaagtggtg  1260
atcatgaccg atgcgatgtg gacggtagcc atatcgctac gcttatcctt acgttcttct  1320
tcagaatatg cgtacgcttc atacaaa                                      1347
```

(2) INFORMATION FOR SEQ ID NO:275

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 354 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...354

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:275

```
gagttgatct cctttggacg agacgtctcg gatttcctgc cggaggggtt gtcctcgatt    60
aagaaaatca aaacaaaaag ccttgcagtt cagacttcgc aaggcttttt tgtgtccaaa   120
attcagccgg tggtacatta tcgggtctct atgagaggaa aaaagagtga ttccgaaagt   180
agtgactctc tcaatatcat acgccaaaaa agttttcaac aacgaagatg agtttggaat   240
gattcaaata agcatctgta gagaggagaa aagccgaggt aaaagtgcag ggaaaggaac   300
tggcatagat cgaaattcca cttaaaacca agccgtacaa cgactggata taaa          354
```

(2) INFORMATION FOR SEQ ID NO:276

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 686 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

   (ii) MOLECULE TYPE: DNA (genomic)

  (iii) HYPOTHETICAL: NO

   (iv) ANTI-SENSE: UNKNOWN

   (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

   (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...686

   (xi) SEQUENCE DESCRIPTION: SEQ ID NO:276

```
tccccgggtt ggattgattt ggtttcgagt atcccgatga taaatttttg cggtttggtc      60
gagtttttag attgattcgt ctattccgaa ttttgagact tttcgcacca caaaggaatt     120
tgttacctat gtttttagaa tcaaagccag ggcgcattta cttcagccac gattttagcc     180
atcttattga tcatttctct tccatagcga ttcttcaagt cgaaaatgcg tcgaccagca     240
atatccaaca gcggaagatg ctatttggtg gtcttacgtt acgatcacaa ctgtggctat     300
ggagacaaat accccgtaac aaccgaagga agaatcattg caagtttttg atgactgcag     360
gagtagggct tttcggaact tttacagcct atttgcttcc ttatttgtct cagataacaa     420
aaaagaagaa acagaaacaa agaatgattg tcaatcttat tgctgctgtt gcctgatatt     480
gagcagaata cagctgatac cgcttccact taattccact catgaactct attatcaaaa     540
gatggttgta cagcgaaagg ggcaaattgt attcttttcc gattggagag atagattgac     600
accaatgcat tgtttagatt ctaatctgtt ttgaaggata agattcccga ttaaatacat     660
tggcagtgct aaaaaaacaa atccct                                          686
```

(2) INFORMATION FOR SEQ ID NO:277

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 1119 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

   (ii) MOLECULE TYPE: DNA (genomic)

  (iii) HYPOTHETICAL: NO

   (iv) ANTI-SENSE: UNKNOWN

   (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

   (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...1119

   (xi) SEQUENCE DESCRIPTION: SEQ ID NO:277

```
caagttgttg cacgatgcct atgcaaaagc tttagagctt cgnaagttgg ttccggacag      60
gaggtcgaaa atgtcgttaa gactatctat aagcctttac ggccgagaga tttcagccaa     120
gatggtagag ctattgaagc cggaagggtg cgtgccaagg tggagatcgt atatcaaagt     180
ttggaaggct tgcatcggcg ataccgaatc atccgggaga ctggtatttc tccggcgatt     240
atccgcaccc ggaggcgctc atttggtaaa tgaagctttt atcagctaca tggagaggac     300
tatggcaaat aattatttcc agaatcgaaa gagtattaag aactatgaga gagcaaagaa     360
```

```
aagcgacatt gatattggac gatggtagcc gttcgaaggc tattctttcg gttgcgaacg    420
tgctgtggcc ggagaggtcg tttcaatacg gctatgaccg gctatgtgga gagtctgacg    480
gatccgagtt tcgcggacaa atcatggtta tgacctatcc tttggtgggt aattatggct    540
tccgatgaaa gcagctgagc caaacggcgt atcttgcttt atggaaagga cagaatacac    600
atggaaggaa tcgttgtgtc cgactattcc cattctttag tcattggaat gctgtcgaaa    660
gccttggcga ttggctcaaa cgtgagaggt attcggtctg acggggatcg acacgagggc    720
attggccaag cacctcgcga acacggttcg atgaaaggaa agataattct cgaaggaggc    780
gaagcattgg cttcgccgat ccttacacag tcaatcaggt agcggaggct tctgtcgtga    840
agtaatcgtc tacggcactg gaagcaaaaa ggtggtactc gtgattgtgg agtgaaggac    900
aacattattc gctcgcttct ccgtgaagat aaacgctcta ccgtgtacca tgggattacg    960
actttcatcg aatagcatac acggtctctt catcagcaac ggcccgggcg accccaatat   1020
gtgcagcgta cagtggaaca tattcgtcgg gctgtggccg gcgacaaacc tatctgcgta   1080
tttgcatggg caatcagctt ttggcgaaag ctgccggggg                         1119
```

(2) INFORMATION FOR SEQ ID NO:278

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 2509 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...2509

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:278

```
tttccgtttt tgacacttcc taaaaaccat ggcgtgggaa cttttttggt tggcgcggaa     60
agcaaaaaat tctcacgcca caacgaaaaa aatctcgtcc attttttcag aaaaattcgaa   120
ctaaaatcgg tgcatttttg gttcggacga tgagtcagac gtgtactgtg gtcagaaaaa   180
tatcatccat aaaagatcgg gaattagcag agagacaggc tatggctaat aggatcatcg   240
aagtgatcat cgtctcaaca actacaaagc gcaggctaag gatcggctca actcgagtaa   300
ggtcttgtgc accgcaagcg acgatgtatt gaacccgagg cgactttggg caacttaagg   360
cgaacatggg gtatcgacgt ttcagacata tggaccggag tgggtgaaga tggactttgc   420
ctttccggct atggctttta accgaaaaaa ccgggcgtca aattggccca aaaggcaaaa   480
aacacctcgg gaggcatatc aatcctcaat cttaacctga tttgcttcta cgtcatcgaa   540
agctaaaaag taacgccagt tcgatctaag cgaacatacc ataaaaatac aagtagctgt   600
aaatcatact cttttgtgat tctccggctg cataatgtcg ggaagaaggg gcggcttcta   660
agtcattggg cttcagatgt agataaaagc catctgaaag caatataagt gcctgaaaaa   720
cactgtgtgg aaaataaaca cactaataac caatgtgttg tgccattcct ttatatcgag   780
ctcagtaaaa agtagggttt caagatgaag ccggttgcct aaccgactgc aagagcaaaa   840
aaagagggct gtgacaaaac tgaattttgt cacagccctc tgcatttgga aaattcttca   900
gtaattattc tgcgctctca gcagcaggag ctcttcggca gcagcttcca cgggagtttc   960
ttccgtttcg gcagcttctt ggcagcggca gcagcctctg cttcagcctt agctttggcc  1020
tctgcggctt tttctctgca cagcttctg cacgagcctt gtttacggcc ttctctgctc  1080
gagcttaacc ttatcgtccg ctacagcggc ttctttcacc tttgcctcat gttgttaaga  1140
gcatcttttt tgcccttcaa ccaagcctcg aacttgtttc tgctgcagct tgatcgaaag  1200
cacccttctt aacaccacca aggagtgctt catcatgagc acaccctcac gggacaaaat  1260
attacgtgcc gtgtggtagg ctgtgcgcct acaccgatcc aatacaaagc gcgctcgaaa  1320
ttcaatctat tgtagcagga ttcgtgttcg gattgtatga accgatcctt tcataaactt  1380
gccatctcgt ggcgccctgc tgtctgcgac aacgatctta taaaggcata acctttgcga  1440
ccatgtcgtt gcaatctgat ttttgttgcc ttcttttgaa tttattattt gcgttcgcta  1500
ttgtattagc ggctgcaaaa tagattatta aaatggaaca aacaaagtgg ctttctcttg  1560
gcacatacac aaaaaacgat cgggtacaga taagcgctca gcctgtctgt acccgatgga  1620
tggtggagct ggagggaatt gaaccctcgt ccaaacatgg aatcaaatgc tttctacatg  1680
tttagtttca gttggaattt tcgtgagcga gcggagctga aacgacccaa tgcacgatcc  1740
ttatcttccg ttcgatctga ccacggcagg aagcatcctg tagcggttcc cgatttgtca  1800
```

```
gcaccgcacc atcagctact tcgggaaaaa gctgctcggg cgatgtctcg tcgctgccac   1860
ttggcggcga tgaagcgtct aatctactat tcttcgatta cgcagcgaga ggtagttatt   1920
ttcgccaatt aaacttttga tgtctgagat tatagtgcaa ccacccacgc actacatgct   1980
tacataccgc ttcatcacgc tgtcaaagcg gtcagcccca ttgtgggtat cgatagtggg   2040
agcaaatgta gcattattac cgaagcgatg catctttttt ttcgaaagtt tttcattgat   2100
catttacgac gtgtacttgc cgtttgattc ccttcggagg aaggaagcaa tccagaggga   2160
aaagagatgg ttttcgcctt tactccttac ctttgtccgg atcagatgtt tctgatcaga   2220
tataatgagg aacaggacaa tgcacaactt tgcctcatcg gtgtggccgg ctatattgct   2280
ccgcgccacc ttcgcgccat caagatacag gcaaccgctt ggtatcggct atggataagt   2340
tcgacagtgt ggtatcatgg acagttactt cccgaaagct gccttcttta cggagcaaga   2400
atgttcgacc gtcacaactc caagctacga ggaaccgatc aggctatcga cacgtgtccg   2460
tttgtacacc gaactatctg cacgatgctc attgtcgctt ggcctgcga              2509
```

(2) INFORMATION FOR SEQ ID NO:279

     (i) SEQUENCE CHARACTERISTICS:
         (A) LENGTH: 1341 base pairs
         (B) TYPE: nucleic acid
         (C) STRANDEDNESS: double
         (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
         (A) ORGANISM: PORPHYROMONAS GINGIVALIS

    (ix) FEATURE:
         (A) NAME/KEY: misc_feature
         (B) LOCATION 1...1341

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:279

```
ccaaatgaat tcatatatga atttctccaa ctatttctat ttctcttcag gttcagtaaa     60
tatcttctat gcaaaaggcg tattttagtt cgcaaagtac tcatttataa taagaaaggc    120
aaataaaacg gcaagaaaac gcctcttcga gcataaaaat gtcgcaagag gtgtatgtgg    180
taatcagggt acataaacag ggcaaactcc acctttcgtc gtttgacgag acctctgagg    240
actttccctt gtatcggcag aaagagacaa attcacgta gaaattcctg tcgccgactc    300
tatcttccgc aacagtcggc tcttgggatg cttgccgtat ccggcaacct gcctgtcccg    360
acattgtagg aaaggacggc aagcagaaga acgttccatt taaaacatct gaagataggg    420
atttacaata gcttcctaaa ttcatctccg ccaatctgtt gatttcatcc ttgtagattt    480
caaggtgatg aggatgatgt tctccacata gataccgatg gtcatatccc tgtttctcac    540
gacatgacta tctccgccaa cgtgtcttgc aactctttgg caatatagtg gtcttgcgat    600
ttttcaaggt gttgcgacag atgaaaagcg actcatatca cctttatcag cctttcgcct    660
ttctcttctt gggactcttg aaaaatcttt gacattggtt cttcatttgg acgttccgat    720
tcaacacact gctctctaat tgagagcgtt ttatttcgct ctcatttctt ttcatgggaa    780
tacctgtgaa acaagttccc ggatggcaac aggatctacc ttgccgtttt ggtctctgtc    840
atactttctt aatttttatt attacacaat tcattgttca ttcgttgcca gtatatttac    900
cgatgaagat gaatacatcc gctatcgaag aatgcccaat aatcggcttg taccagtagg    960
gctacatcct ttcattcata cctttctgtn ggagatgttc attagtgtcc atcaatacaa   1020
tcgttcgatg tatctgcctt cgcacattcc cacgttcgag tgnaaagaat caanggactg   1080
ttctttgaca tacaccctcg cctatatcgc tcatcgaaac gtgatgtatc gaagacacat   1140
accatcaccg acatattcga cagtgcaaat atatggtcgg tgatgctgta atcagcgtga   1200
tttcctttag tgcgtacttg tggcacgatt tggataattg tggcttcgtt ctacctaata   1260
gctttgggta caaggatcgt aactttgcag taagcgataa gtcggtattt catggcttgg   1320
gaacatacat ttcgagagaa t                                             1341
```

(2) INFORMATION FOR SEQ ID NO:280

     (i) SEQUENCE CHARACTERISTICS:
         (A) LENGTH: 869 base pairs
         (B) TYPE: nucleic acid
         (C) STRANDEDNESS: double

```
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
         (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
         (A) NAME/KEY: misc_feature
         (B) LOCATION 1...869

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:280
```

```
ggcaaagctg gaggagctat ctgcatctct cccgatcgtt gaggggctgc ttcgttgatg      60
cgcaaattca aggagcaagg tattcgctct gccattattc gggaggattc cgactttatt     120
cgcacaacat caaagagcgg tacggctcga ctacatctgc acatcggagg cagaggtgga     180
aaatggcctg ctgacagtcg tctatcgggt accatagtgg atgcgaaggt caaagccgaa     240
tttctcgctc cctggccaag gagctatccc tcacccctgc cgaaataatt gccgaggcga     300
tggagccaat gatgtaccca tgcttgactt ctcggccggc agctcatatt caacagttcg     360
gcacatccgc cttccatgcc tcaactacgc atgaagccat tctccaattc atgggttgcc     420
gatagtcgcc gacccgatcc gatagaataa gaacctccgt gctaagagaa atttatcgta     480
cggaggtatg tttttggcgg aaatatattt actttgggat agaagagtag acccataaga     540
gcttgaatac gatgcgatcg tatccgaagg gcatgcgaaa tatagatcgg aaaggtgccc     600
gtattctttg gttttgcgag cttctttttt gactttccgt ggagtttttc ccctgatgta     660
tggccgaaga ggaagcattc gtgcctttca gggcataggg acaaaatttt taagaataca     720
attatcagat ttatccaatg aaagtaggtt tgttcatccc ctgttatgtc aatgcagtgt     780
atccgaagtg ggtatcgcca cgtacaaact gctgaagagt ttggacatag atgcgactac     840
ccgatggatc agacatgttg cggccagcc                                        869
```

```
(2) INFORMATION FOR SEQ ID NO:281

        (i) SEQUENCE CHARACTERISTICS:
            (A) LENGTH: 703 base pairs
            (B) TYPE: nucleic acid
            (C) STRANDEDNESS: double
            (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
         (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
         (A) NAME/KEY: misc_feature
         (B) LOCATION 1...703

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:281
```

```
gtcgttactg tttgcaggat actctcccta tcgtatctct ctattgatta gagtgcgttc      60
cgagaatgag tttaatctat ttttcgtggg gcaagataga atttttcaat tccagcagtc     120
tttcccctct tctttctgcc tttcagccga gagcctcgaa acaggcaaaa ggataaagga     180
tgcgcgacga agtatcctac aaagttccag aaaatgatca ccgtcgggac tgcatatcga     240
atagcgaccc tgtgcgctta taacggatca gacgagcaaa aagataaagg gtacgaacaa     300
aggaccgaaa gcaacgacgt aggccacagg gtgcctatcc cccaataaag cattgtcata     360
gacaaacagc aagaggagat agcacgtcca taaacggtat ttgctccata aaggtggtga     420
cagccacatt gcgaacgaca gcatgaaaga gcgaatctgc tcacagcgga gcacgtgtcg     480
ttgtacccaa tgaagagatt gcatcccgta cgggagctga gcagatagcc aatcatcacg     540
ccaaggaacc ctcaccggat ggcataatga atatgcaaga gaagaaaaaa accgtgaatt     600
tgtagtttgt gactaagaga cttcccggcc tttctacttc gctctgtccg aatgcccatg     660
```

aaccactctg ctacagccgg atggcctagg cagggatgaa ttc

(2) INFORMATION FOR SEQ ID NO:282

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 486 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...486

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:282

```
ccccgggaat aggcggattt tcgccggcta tcgtactgta tctgctgatg ctatcgtagc    60
caagcgtaca ggctgcgagc agaagtgaag ctaaaatctg ctccgctctc ctttcctctc   120
ttcttcatca caaccaaaaa gcaccatata atatggaact aataggcact ttttttctta   180
tcctgctaat ctattggtaa tccgatttct gattcggatg ttcgccattc gtcagatgtt   240
tttcgacaga agaagaactc ttcacgacaa ggaacagaaa cctcaaaaaa ccctctccgg   300
gtgaaaaagt cgaactcgac gaacttgaaa agcgaaaatt tgaaaagacc aaggagaata   360
ccgtagactt cgaagacata aaggacaaga gcgatgcang aaccggatgg atccatatat   420
tcagcagact cggatccttt tctccgatat caccctgtcc gcttggatac cggatccgac   480
atataa                                                             486
```

(2) INFORMATION FOR SEQ ID NO:283

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 1345 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...1345

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:283

```
tctgcatcat ctttttctcct ctctgcattt atcctgcctg ctctcggaca aaatccaagc    60
aggtacagcg acttgagaag caacgtaagg aggccctcaa gccatcgaaa aaaccgatcg   120
cgaactacga ataccaaga aagacaacaa gacaaacaaa agcatctcaa cctcctgaac   180
aagcaggttg ctcaaccaag cagatggtac aactcttgga caatgaggtc aaagagttgc   240
aatccacatt gattccatga cgggtgtatg tcatcagctc tctgtagaag agaagcccga   300
tccgatgaat atgcccaagc tctacagtct atgcaaaagc ggaacgctcg ttggatcgca   360
tccttttcat ttcatcggcc aagagctttg acaaggcatg cgacggatgc gtttcttgga   420
acaatacgct tctgcataca actggcatct gtccggctgc gcgatacacg tagcaagttg   480·
```

```
gagactgaac tgcgactgta gaagacgcca aaaaggagaa aggacatctc ttagtcatcg    540
agaagaggaa aaaaagaaac tcgaaggaca gcaagccgag caacgtcgca ggtgcaggct    600
ttgggagcca aacaaaaaga cttggaagcg cagctgcaaa gcagaaaaag caagccgaag    660
ctctgaacag aaagatcgag aaacagttgc caaggaaata gaagctgccg aacgtcgtgc    720
tcgagaagaa cgtgacggtt ggcacgcgaa gccaaagcca agggtaagcc ggttcctgcc    780
gaacggaacg gaaggcggag accaaaggcg gctatgctat ggatgcctct gaggtgctct    840
ctcgggcagc tttgcacaga acaaaggtcg cctgcccggc ccgttcgcgg cagataccga    900
atcgtaagcg actttggcgt gcatcagcac atgagctgaa aaaagtacaa gttaataatg    960
gaggtatcga catcgctgta caacaggatc cgatgctacc agcgtattcg atggtgtagt   1020
gtccagtgtt tcgtgatacc cggttataat tcggccgtaa tggttcgtca cggtaactta   1080
tcacggttta tgcgaatctg agcaaagtgt atgtaaattc cggcactgtg ttaaaacggg   1140
tcaggctctt ggtcgtgcct atacggatcc ttccaaaacc agaccattat tcacttcgaa   1200
atctggaaag aacgcagcaa acaaacccaa gactatggtt acgatagcca ttcccaacga   1260
ctataatacc ccattcgaga tcttcctgga ttccgaaagt ggcttgctac gatcggacat   1320
tcgtggcata cacttcgggc atcgt                                        1345
```

(2) INFORMATION FOR SEQ ID NO:284

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 574 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...574

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:284

```
ggctgtgttg tccggctgtc ctgtcttttt gaatttgacc atgatgaaga ttccggtcgc    60
ttctccggtg tggagagtgt ccatttgtta tagtaagata gaaatggata gaattggcag   120
gtgccgactc tgcaatatca agatattcga tgtcttatag gatgcagcag ctgggatctc   180
ttgagcttct gtggtaggaa ccccttcgtt accgaattgc gaaactttgc ctgtatattt   240
ccgacacttc atatccttgc acattgatgg tgggttttat catgcgaatc tttgtgccac   300
tcgtttgagt ttataatccc ccaacagttt cccttctgtc gtaccatatt gatctgctta   360
ttgccatgag caagcattac gaaatcggca gggctgtcgt agaagagact tcaatagatt   420
tctctaccac aaattgagaa acgcagcttc tgtggccgga gcattgaaat cgagattggc   480
cactacatag tgctgaagtt gttgttgcca ttgaatagtg gtcgcatttg ctctttgacg   540
gaatgatata ngcccttca tggatttgat agtc                                574
```

(2) INFORMATION FOR SEQ ID NO:285

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 384 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

```
(ix)  FEATURE:
      (A)  NAME/KEY: misc_feature
      (B)  LOCATION 1...384
```

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:285

```
gggaaggcgt aatgaagaaa gaaattcttt cagcagatta caaaggcgag ttgttcgtca    60
ttctgtagct gattatgtca aagccgaaga cttcgctgaa acattattga gcgtcatata   120
gaagcaagca aatccaacct caaggctcac ccattgtcgt tgccggtggc tacggagtcg   180
gaagcaagga aaatttgccc tcttgcatga tcttgcatct gtattgggtg gagaagttgg   240
agctttcgtg ctgcggtaga tgctggtttt gccgatcatg acatgcaaat cggaagacag   300
gcattaccgt tcgtcccaag ctctatatcg cttgcggngt cagggacaaa tccagcacat   360
cgccggtatg ccagggganag ctct                                         384
```

(2) INFORMATION FOR SEQ ID NO:286

```
    (i)  SEQUENCE CHARACTERISTICS:
         (A)  LENGTH: 967 base pairs
         (B)  TYPE: nucleic acid
         (C)  STRANDEDNESS: double
         (D)  TOPOLOGY: circular

   (ii)  MOLECULE TYPE: DNA (genomic)

  (iii)  HYPOTHETICAL: NO

   (iv)  ANTI-SENSE: UNKNOWN

   (vi)  ORIGINAL SOURCE:
         (A)  ORGANISM: PORYPHYROMONAS GINGIVALIS

   (ix)  FEATURE:
         (A)  NAME/KEY: misc_feature
         (B)  LOCATION 1...967
```

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:286

```
cggataagtt ggcacgggct acatcgacat ggataaatat cttcaggact cgtacgggac    60
naancgatac tgggagacta agcggtacca attatccgaa ggagnaaaan cggctggaaa   120
gggnctgccg ccgaatatga atcgcgttgg agtctatcaa aaaagaacgc aaacaaatac   180
tggacgaagc ccgccacaag catccgtgat gctgtcccaa tcgtctgcac agatagagaa   240
atcaaccgcg acatcaaaga ggcacaagcc gaaagggaga aaacgcggag agcagacagg   300
agctgaacga cttcagggaa acgatcaaca aagaagagat cgaaaagaag agcgaatcaa   360
tcgggagata gagaaaataa aacggaggaa aaacggaagc aggagaaagc agcaagccgt   420
tcggccgaaa cacctgtaca gcaaagctgc aagaagtgcc ccaacccct gtcatacaag    480
tgggcgatac gtacgaatca aaggacagac ggctataggc agtattatag atatgaatgt   540
cgggaggcta ccattgctct cggaatgatc aaaacgactg tgccgatcat cggttggaac   600
cggccaagcc cgtcaaggag cggaagtctg agcctgttcc ggggcatctg cccgaatgat   660
catagaccgg atccacgaga agcgttggat ttcaagcaag acatcgattt gcgtggcatg   720
cgtgtgaacg aagcctccaa gccgtcatgt attttatcga tgatgccatc caactgggaa   780
tacccgcgta cggatacttc atggaacggg aacaggtgca ctcagaacgg tgacagggag   840
tatttggcca cagtcaatgg cgtaaggcat tttgcagacg aaacgtccag ttcggaggag   900
ccggcatcac tgtcgttgaa ttgggatgat actttcgata cgatcccaaa tggctgaaat   960
catctgc                                                            967
```

(2) INFORMATION FOR SEQ ID NO:287

```
    (i)  SEQUENCE CHARACTERISTICS:
         (A)  LENGTH: 1154 base pairs
         (B)  TYPE: nucleic acid
         (C)  STRANDEDNESS: double
         (D)  TOPOLOGY: circular

   (ii)  MOLECULE TYPE: DNA (genomic)
```

(iii) HYPOTHETICAL: NO

(iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
    (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...1154

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:287

```
gtgactattc ggcaaagaga tatgaagacg agccactccc aaagtgtcgc acgaagactg    60
acatcggcat gcagttcttt gagatcgaga ccggtatttt ttcgagaaaa gaaagatggc   120
gcagctgagc tttcagtccc gtactgtcgc ttggaaaaga cgtactttgg cattcaagtc   180
gagcaatccc aatgtgcgga ttgggtcttg tacaatcccg aagcagagag ccggcagttc   240
ctgagaagat ggtattgata ttgagtcgta gccggctcgg ctcttccgga ttctactttt   300
cagagcatcc agaaggaact gaatgttcag agccgtatcg ggagcgaacg atatacatcg   360
agttcgcctt tgaacagacg agcagaggag aactcagacg gcctttcaaa agagggagca   420
gatccagccc cccggtcaaa cttcggctga caccgcagga cgacgggcac gatcgaagat   480
gacaatatcg cgatctccat ttgtcgccac caaccaatgc tgatgtgccc gatgcggact   540
gcgttccgag tgctttggat agctcggtct gcacacgtcc ggcgacggac gcttcactga   600
cggaatttgc aaaatcagat tgggaaggat caacaggaaa aagcaacagt cagcacggcc   660
acgacgatcc atttggagcg acgcatgcct tgcgataacg acggataaac cggatgagac   720
cggctgacag tttttccttt gactcacgca gacaacttta ctttcaagtg gcaaagatac   780
ttacttcctt agcttaaaag tcgaaaaaga gatccgccga agctccccca aaaaggaatc   840
ccgtaaaaac cgaaaatctg taatatactg tatgaaaagt ctacaaaatc cctatcggca   900
ctcccgataa agaaaacacg agcggcaaga ccaaaaaaac ggaactgaaa aatccgaaat   960
agtcgttcgg tgatcaaaaa ttctcgctcg tctttttttc gcttttggtt cgagatttgg  1020
aaaaaagaca accgtaaatc cgaaatcatg gcgcgagttt ttcccgattt ttcgttcgtt  1080
tttgtctgtt gcgactgctc tatcagtagc cgataacaga ttttatccaa atgggtattc  1140
ggagttttgt atcg                                                     1154
```

(2) INFORMATION FOR SEQ ID NO:288

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 2717 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...2717

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:288

```
ggcgcatgtt tttataccaa tggatagtac aagcagggat gattcggtat cgtgccagta    60
gaattacaga tcctttccat gcgattcttc atgcttatcg tatgctgatc ggacacaaag   120
aagatgaagg ggggcactta gaggataaag ggaggggatt tgttagggcg gatttcaaaa   180
aaataagggc tatctccgac agcccttact tccttattaa ccttaaaatc taataccatg   240
aaaaaactgt acaaaaataa ggcgatgtat ttctcgtgca actatattag gccaaaaggc   300
gcatattagt ccaatcaata tttgttttcg gccttatact ctttttttctc ccatattcga   360
acgggatca tacgccagaa agcgaccagt aacgatagcg ccagtcgaaa gtcagcagtc   420
tttttcgacg gatgacagcc ttactattgc ttgggcaact atcttggact ccatcagcat   480
tggatactta cgtctcgtag cagggggta tcgacaaatc cgggacgaat ctccgtaacg   540
tcaggtgtag gctgtctgtc gtggccaatt ggcgtatgga ttggagatgt gcatttggaa   600
```

```
gcgtttggtg gcggagtagg caggagcgga tcccattctc ttgttgctgc taccgaactg    660
atggctacta tttgaccctt tttccgaggc gaaaatagcg gtaggcggca ccgatcattc    720
gggtaaatcc ttctcattgg tacggagggt gtccagctct ttcgtttcgt ccagttgcgg    780
attgtataac cgataccgga cgagtggaag tatacatcca taccgctcat ttctcgatga    840
ggtgggacag ccgttcagga gcatcggaat gcgtgatgtc tatacggctg tataaacctg    900
tgagggattc tcctgcttca atgcatcgag ctttgggtat tgcggccggc aacacctacg    960
aaccaaccgc gagagataaa aggcgggcta catcaagccc gatgccagag gtggctccta   1020
cgacaacgat cgtttggctt ccatgatttc ctgttatgaa atgaagtcca tcccacgaga   1080
attttcgctt cttctgtcgt agctcctacg acagtgaaag ccttcattca cgtgggtgcg   1140
ggtaggcttt gcgttgttct tcgaatgtct tcggcgtgcc cttagcgatc gatccggtac   1200
gagcggatcg aaggtatgca gcaaaccctt tcgatacgat ggtcggggaa gagcgacaga   1260
tctatgatgg gatggtcggt ggggggaggg ctaaagtatg cagcagggga aattccagtc   1320
cgatacttcc gtaatggctt caaggcacat tctggctcca ttggcttttc cgctgcagag   1380
aatcctgcta tgtgaggagt cgcgatgtct gccaaatcca aaggctgagg tctatatcgg   1440
gttctccttc ccagcaatct attacgaggg ttggagccat ccgcttttga cagcccgaat   1500
aagagcttgg gtatccgctc ggctcctcgg caggcattga tcaggatagg ccttttgtct   1560
gcacagctcg tagaaaagcc tcaccgatga ggtgataggt ggcgtgaggg tcttcatggt   1620
gagggaacg tggaatgaga taatgtcgca ctgctccacc agtcggttag aggaagaaag   1680
ctattgtcct gctctgcctc cgaccgaggt ggatccagag caggaactcc atgccatagg   1740
cggaggccaa acgcttcagc tcacgcctac atggcctaca cccactatac ccattacctt   1800
ctctttcagg gaaaaccctc gcgcaaagcc agacgacaca ggcagcacat tacatactgc   1860
gcacggccgt agcattgcag ccggggggaat tgcgccagag gataccgtgg cttcgcagta   1920
ttcgcggtcg atgtggtcga atccggccgt ggcagtcgtt tcaaccgcac atcagtacct   1980
tgcagaagag ccggtgtgca cttggtgatc tgcggacgat cagcacccgg gcatgacgta   2040
tcgtatcggg agagaagcgt ccgagtgtag gtaagtaatg tccgcaacag gatcgacaat   2100
acctctcaat agggcacgga tgcttctgcc actattttga gaggaccgga tagagagaaa   2160
gcatttctta ggcttcgcct tttattttgg ttgggaatgt aaatggcat ccgatacgcg   2220
ttgctcggtg tggatctcgc cgtgttccac ttcgagcgat ggatattgtc cgagagagtg   2280
gtcaaaagtc ttttggcatt gtcggagtca ggatgatgcg attttggact cgtgcggtgt   2340
cacgattcgg aacatacgga tgaagtccaa gacaaattcg ctcggagagt gcatcacgat   2400
aagagattgc agtagttgcc ctgagctatt tcttcgggca gttcgatgtt attgttttgc   2460
tttcgttttc catttgttct tgaatgtttt aataagtaga tgagggaaag tgccaagctg   2520
aataacgtat ggcaccgtta ccccctttga acaagttac tcctttcgtc taaatgtgaa   2580
taagggttca cgtgccagag tgaaattatt gcggttcgaa ttacggataa tgctctttc   2640
ccatccgtac aaatataccc tgtacgaaat acgctctttt tgccgaggca tacttgtaca   2700
gggtaagtaa gcatgtc                                                  2717
```

(2) INFORMATION FOR SEQ ID NO:289

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 522 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...522

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:289

```
ggccaaatcc tgctgtacga tcttttcatt tttcgcagcc agttcggccg aagagacgaa     60
atttcgtttt gctgcttttc caccagctcc atcagcttcg gacgttatac tccagcttcg    120
aaagatcgag ttcctcttct ccggtcaaga ataatccttt tccttacaaa agtaaattat    180
ccgcgccaaa ctggcactaa ttttgtgtac ttgtataaag agtaaataag acagtcatta    240
cggagaaaaa gatttggtta tttttgtctt cacagaaagg ctgctctgca taatgcttct    300
ctatattcaa ggagccggta atgaattgaa aaagagaaga ttgatagaat tgcaaaacat    360
agaaatgcta ccactcatga cccaccgcct caatcaatcg gaatatcctc ttcgatcgga    420
```

```
tatgctgcag cgatagacct catcccggtc gggattgtag agaacgaatc catcagatat    480
gcaaatcata atcgaccgat agcatcatag cataggacaa gc                        522
```

(2) INFORMATION FOR SEQ ID NO:290

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 399 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...399

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:290

```
ggcataaacc tccagcatcc gtctggcttc ttcttcggct tcctcttttt agcatgagcc    60
gtatgccctt cttgccaaag gaattcggct gtccggagaa aagacgtgta cgcatttccc    120
atcgaactac attggcccac tgattgcgag gataggcaga tcacggtggc tttgtatcca    180
gttcttatat gtattcaaat gatggtctcc gatgtcggac gtacgatcag ctcttcttcc    240
aacttgcttg cggatccact actacgccgt ctccatcggg attggctttg agccatagtg    300
agttaccacg gcgcattcct tagcaaagcc ttccacatgt nctcttcacg gctcaggang    360
ctcttcggga taaaaagagg gaaataggca ttaccgtgt                           399
```

(2) INFORMATION FOR SEQ ID NO:291

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 474 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...474

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:291

```
tgatgtccgt gatgatgtgc ctcatgttca tgtttgtgct ccgagcaacg gcgtgggcgt    60
gagattgttt tgtttccata gatttgtctc ctacacatat gatctgatgt ttttgttttg    120
acggcgtgtc ataatgagca atttgctcgt tgcctgcgac attcggcttc agtcacgtac    180
ttcagtacgt tcctttagac tctgttttag cacctttgtg ctccaaaaga attttgacac    240
tgctcatctt tattgcaaat gtcatcattt tgtcgacatt tttaccatat atttgccgtt    300
tcaaaaagta taacccttga tttcaggaaa ttcatcatgc ggctaaagat cgagaaatga    360
gccgagaatt cggtttggag gtaattaatc ggcagcctac ggtgtccttt ctgtcgtgga    420
ttcggacggt gcaccctatg cttgcctctt ttcatcgtgc gcgatgggga gaat          474.
```

(2) INFORMATION FOR SEQ ID NO:292

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 1709 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...1709

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:292

```
caaaacagaa aaactatact acctttgtta cctaaacatt gcgataccca tcatgaataa      60
cttttcaaa atacacgaca acttgctacg caacctatcc cttcgctgcg taggggattg     120
atggacgaga tcgattggaa cgatagatga tcggtatcaa gggtgcacga ggcatgggaa     180
aaaccacatt cctcctgact atgcacgcga aaacttcggt ataggcaata gaaaatgcct     240
gtatacaatc tgaatcaact ctatttcacc acagaatctt tggtgaactt cgccgtgagt     300
ttgtcaagca aggaggagag gtactgctac ttgaccaagt attaaatatc ccaattggtc     360
tatagagctg cgtcagtgta tggagctata ccggacttac gcattgtctt tacggggtct     420
acggtgatgc gcctgaaaga aaaaatcccg agctgaacgg actggttaca tcgtacgttc     480
tgaacggttt tcattccgcg aatttctcaa tctcaaaaca gggctgtcgc ttcagccttc     540
agcttcgatg agattgtatc caaccacgaa cagatagctc cgcgaatctc gagcaggtga     600
accctctcga ctggtttcag gactatcttc accatggtac taccccatat tcctggagga     660
taagaactat tcggagagtc tgctgaaacg ctcaatatga cgcttgaagt agatgtgctt     720
ttcatccgac agatcagcag cgattcctgc acaaactgcg caagctactc tacctactgg     780
gacacgtgct cccggctcgc tcaatatatc gagcattgcg aaggaagtgg acattctcgt     840
acgacgataa ccaactatct gaagtacctg tccgaagcca gatgatcaag gagcttcacc     900
gcgaagagga gacgggtgcc aagaagccgg catgatctat ctggacaata ccaatgtggg     960
atacgtaatc cagccggaac tctcaactat atagacgtac tcaaaacatt cttcctcaat    1020
caggtcaagg tcgcaacgaa gtatgtttgg gatctcgctc tcaaatcgca ttctgcgtaa    1080
tcgccaatat cagttctgca tcgatgagaa gatgagccgt cgctacaacc cgaccgctac    1140
tatgccatcc agaacatgcg cagcggtacg cgcaactgat ccccctctgg ctcttcggat    1200
tcctgtacta aaaaaacagg acaacaactg tgaaaccga tcggggcgtt cggcttgtcc    1260
tcactttgct ctgatcctta gtgagcagac aaagaatatg gacaaagccg atgcatccgc    1320
aacaccgact ctgtttcagg gttgctattt cagaatacaa gaccgaaatt atactttta    1380
taactaaaaa ccaaaatggc taaagaaaaa aaattcctaa ctgtgacggg aaccaagccg    1440
ctgcgcatat tgcttatatg ttcagcgaag ggctgccatt tatccgatta caccttcgtc    1500
tacaatggct gagtatgtga cgattgggct gctgccggcc gtaaaaacat tttcggcgaa    1560
acggtaaggt ccaggagatg caaagtgaag ccggtgcagc cggtgcagtt cacggctgtt    1620
gcagggagga gcactaacca caacctttac ggcatcacag ggcctatgct catgattccg    1680
aatatgtaca aattgcggga gagttgcta                                       1709
```

(2) INFORMATION FOR SEQ ID NO:293

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 463 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
    (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...463

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:293

```
gaaataacat ttccaaatgg agaactgatt aaggacaaaa agatccggag gaagattata    60
agatgaaatt caagaatcta atttatactg ttccagaaac agaaagcacc tatcttacca   120
aacaaaatct ttcgatacaa aaaagaagat gagcctatgc aaagatgagg atcatgattt   180
gtgcgaagat gatacgacga acatcgaaag cggatacacg gtggcgtaca ccacagaggc   240
tccgtacctt tgagctggct attcacatag tcgagagcca tcggattggc cgtattccgc   300
atatcatacc ggctgtgcca tcgtacctgt tgcggagcaa cttatagaag cccaaccgac   360
caatagcgta ggaagcatcg taatcaaaaa gccgctccga cccaaagcag accgtcccca   420
tggataatgg tatcaaagaa atggctcact ggccaatcca gtc                     463
```

(2) INFORMATION FOR SEQ ID NO:294

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 632 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...632

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:294

```
gcattacccc ctttcagaaa aaagtactcg ctcggataga taaccgacca tcgaaataac    60
ctccgacatt caattgatag aacagtgacg atgccggtaa aagacaagcc gctgctgtat   120
gctcaaatcg aggtggtgga aacgtgctcg gacttacgcc ccatcccgaa agctccgcga   180
taagagagag aaaggacgga gcacgtatgc cctcaccctc acgaatgaga aatccatccg   240
ccgtaaacgg taataaggac gcggattgaa tgtcatctta gctcgtactt ccagaatcgg   300
tgatgaggaa ctatgcgagg aagatcggga tcggcattgc tgaattcaga atatcggtaa   360
tactgccacc gaagagactc cacgtctctc cagcggcaaa ggattgcgct cggccagcat   420
cacgcttgtc tccacattga gttgggcaat aggtcgatac tattggtcag acggacaaat   480
ttatcatcgt gcgagttgtc gggccttgtc cgttgagcag ctccatcatc agatcggtcg   540
ttggtctatt ctttcgcgcg tgctgtacaa atcgaaagag cgatgtccgc ggataattgc   600
aaaagccctc tttgcggagg agaatagtac ag                                 632
```

(2) INFORMATION FOR SEQ ID NO:295

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 784 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

(iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
    (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...784

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:295

```
tgcgaatatg aacaaagaaa tcacttttga taagctaccc gaagcggtac gtatctgacc    60
gaacaggtct ccgccattaa agaaatggta tcagcattca ccctcctgtg cctgaagaaa   120
aatctctcat aggcatagac gaagcgtcgt aattattcag aaagctaaac ctaccatcta   180
tgctttggta cgcaaggaat tgtccctgca tataagcgtg gcaagaaact ctacttctac   240
aaagagagtt actacaatgg gtagagtctg gacgaaaggg tgcaactaca gccaatcatn   300
tgaggagcaa ctggccatga tgcgtcaaga ggtgcgtcgt aaacgaaatc tatcaagtaa   360
cgatgggcca tggaagaaga agctatcgtt ccgaagtcct tcttgacaaa gcaatagagt   420
tgggcttgtc gttcacgggt tgacctttcc tatcagcata tttccctctg agatacgaaa   480
catcattgca aggtacatga gtgccaaggt tttcccatcg attacatcgc ctctgccatc   540
ttgtggcaat tgctgtgggg ataggaaata ctcatcttgc cgaactcaac gcggctggca   600
ggaaagtacg atgctctatg tcgcattggt cggacgtcag ggacaaataa gagtcatccg   660
ctaagctttg cgatgaagcc ttttctgatt ttgactatca ggaaaacaaa ctatacgaac   720
gctcctatgc cgaattgaca acatcatgcg tatgaatcgt aaggagcgaa tagagggagg   780
cttc                                                                784
```


(2) INFORMATION FOR SEQ ID NO:296

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 984 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double :
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...984

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:296

```
tggaaaacgg gattctatcg catcgccgta ggagccggag tgcctattcg ctcgctgtga    60
tcgactatag ctataaagaa atgagcgtat tcgagctgtc acccctacgg gcaatgaaga   120
agcggatatt gcctacatca gaagtcgtac agggcatcac aggcacggca cccccgaaac   180
tttgcagaat cagaaaatga tcaaacacga gagctctcag ccattgagag ttgctgtagc   240
tcaatccgga tagactggga ggataagcac gccaatctac gccgaatgga gcgttggccg   300
aagaaacagc cggtatggcg gatgtcctct tctttcccga aatatgacta cgggcttttc   360
gatgaacgta caagctctgg cggagccttt cgagagggcg aaactatcat gaagcctgaa   420
gagagtgact gctcgtcatg gttggctctg tcggctacga tggccgtacg ggagaacggg   480
aaattctata tcgtgcctat ttcgtgacac cggaaggaga ggtcttccat caggacaagg   540
gcacctcttc cgtgtagggg gagagcatga ggtgatgact ccggcacaga acgccggatc   600
ttcaactatc gcggttggaa gatcttcatc attccctcta tgatctgcgt tttcccgtct   660
ggtgtaccaa tacggatctg gaatacatct gctcgtctgc atggccaact ggcctgagcc   720
gcgtcgcgcc gtctgcaaac gctactccaa gctcgtgcca tggagaacta tgcctatgtg   780
tgcgcatcaa tcgggtgggg gaggacggta tcggtctgcg ctatacgggc gatcggctat   840
cctttcgcct cggggcgagt atcttgccac ttgtgcccga agagaggaaa aggtggctgt   900
accatacgct cgataagggg gcgatgcaac gtttcgcgac aagtccctgc gtggatggat   960
atggactctt cgtcatcaac atga                                          984
```

(2) INFORMATION FOR SEQ ID NO:297

 (i) SEQUENCE CHARACTERISTICS:
  (A) LENGTH: 600 base pairs
  (B) TYPE: nucleic acid
  (C) STRANDEDNESS: double
  (D) TOPOLOGY: circular

 (ii) MOLECULE TYPE: DNA (genomic)

 (iii) HYPOTHETICAL: NO

 (iv) ANTI-SENSE: UNKNOWN

 (vi) ORIGINAL SOURCE:
  (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

 (ix) FEATURE:
  (A) NAME/KEY: misc_feature
  (B) LOCATION 1...600

 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:297

```
ggaagcagtt ggaggacatg cagggataag ggctgtggaa atgatgaaat ccgctttgac      60
aagcggcttg atgagaacac gatgaaggtg tattgtatga ttatcatatt attgaaaaag     120
tactcatcaa ttcatcagaa atttcatact ccgacttcgg tgggaaacgg cagtggcatt     180
acaggcggaa acggaaaggc agaacacgct gatataagca gtagaaaagg tagtcacggc     240
aagcctgcat tctgtatttc caagtatgca gggggttcag acattcgggt gcagccaagt     300
atgccttcgg agaaacaagt ccaatcggca gcaccgatgg agagccgtgg ggacttcaga     360
atacaaggga aagaagtggc tggggcaaat gccacgtggt aagcacggta cggatatttt     420
caaaagagaa aataccgtag ccattagggg attttnctca cgcttcactc cgtgtccgnt     480
gaaaatctcc aataagccaa cggggttgca cccctctgga cacccctgcc gagcctgttg     540
catgaaggaa cgggcaagct gaaacaagtt tcattttccc tctcaccgta aaatcaggaa
600
```


(2) INFORMATION FOR SEQ ID NO:298

 (i) SEQUENCE CHARACTERISTICS:
  (A) LENGTH: 1112 base pairs
  (B) TYPE: nucleic acid
  (C) STRANDEDNESS: double
  (D) TOPOLOGY: circular

 (ii) MOLECULE TYPE: DNA (genomic)

 (iii) HYPOTHETICAL: NO

 (iv) ANTI-SENSE: UNKNOWN

 (vi) ORIGINAL SOURCE:
  (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

 (ix) FEATURE:
  (A) NAME/KEY: misc_feature
  (B) LOCATION 1...1112

 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:298

```
gggaacaagc gagttctcat cacgggagca acgggcttca tcggcggctt ctggtcgatg      60
aagccctgcg ccgtcaatat gaagtgtggg cggctgtggt ccccacagcg atcgctcacg     120
cctgacagac agccggatcc gatttgtgag atcgactacc gcgacccgtc cgatattgct     180
cgcttggctg ataagaagct cccgaaggtg aatccgcatg gcacttggtt atccacaacg     240
ccggttaacc aaagctcgtg acacctcgct tttnagagag atcaatgcag agcaaccaag     300
cgttttctga taggattaca aggggcgaag cactgccccg aacctttgtc ctgatgagca     360
gtatgggtag ctatggagct cctcccgacg acgccaacca ctttcctcct cttccgtacc     420.
caaacctacg actgcctatg ggagagcaag ttgctggcgg agcaatatgt gcaaaccttt     480
```

```
gtcacaatac ctataccata atacaaccca caggagtcta tggacctcat gaccaagaca    540
tctgatggca atccgcagcg tcgacaaggg attcgatttc tccacgggaa tacgccgcaa    600
acactgactt ttatttacgc agaggatctg gcctcagagt tttcatcgca gccgaacacc    660
ccgatgcagc agggcagaag tatatatatc ggatggaaaa gaatacaccg atatagagtt    720
cggacgaatg atccacacct gctcgacaga aaaaacgtat gccatttgcg tattcctctg    780
ccttagtaaa agccacctgc tatatcggcc aaaaatgggc agacatcagt ggccattgac    840
accgcttaac ctcgataaat acgccatcat agcccaacgc aatggcggtg cgactcttct    900
ccgatcaggg caatcggttt ttctcctcgc ttaatctgga gcaaggtttg gccgagacca    960
ttcgttgggc acgtaccacc gacaaatccg tcgttaggag acattccggt ccttccgcc    1020
gaccgtatcg atgttatcgc tatccggtca atccaatctt tcgaggtact tcttacttct   1080
ggactttaac attaacgtca ggtttgaccg ta                                  1112
```

(2) INFORMATION FOR SEQ ID NO:299

    (i) SEQUENCE CHARACTERISTICS:
      (A) LENGTH: 2520 base pairs
      (B) TYPE: nucleic acid
      (C) STRANDEDNESS: double
      (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
      (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
      (A) NAME/KEY: misc_feature
      (B) LOCATION 1...2520

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:299

```
cggccttcgg gaatcgcctt actcattccc cggtaaaacg ctccgcctga agaggatgac     60
cggccggtaa agtggcagtc gtatcctgcg caagggcttc gctccgatag tcgtaagcag    120
gacagccgat aaagtccatt ttttcatatc gtcgatagat tgattgtttt actttgtctg    180
tactaaaaag agtcggaccc gcctttgagc gtcactttta cggtgcggag tttcttttgc    240
aggagtgact cgctccctgc atcaccccgc gggccgcttc ggaaaggatc tggttttggc    300
ggaggaagca aaggtgaacg aagtcccgac cgttcctccc atatggctcc cacttctttc    360
agcgcggaga cctcttccga tccgggaata aaactccttc ctgtccgtcc gtatcgaagg    420
cggagagctg aacggaaacg accgtccgcc atactcgata ctcgtgatat gaagcttcat    480
ccggttgccg cgattcgggc ctgtgccatc agtcgggtat gacggggaat ggaaaggtct    540
gcaggcgagc ggactccagc agacggagtt gtacgaagtc tccatgctca gggtggttgt    600
cctgtccacg accacccgca acgtattacg ggtgacgacg atgccggcac gtcggcagac    660
cggaaaccga agtttcgctc cttatgccgt actcggcgat aaaagccgaa tcgctcatgg    720
gctgatccag agacgaacga ttgctttctt ctccggaaga agctccacag cgggtaaagc    780
cgccgttctg ctgtcaccgc tgtcttgggt gcgggagcat cggccgggcg ttctgactcc    840
gggtgtatgc atcccgggaa tttgcatcac cggaggccgg gagtatttgg ctgccatccg    900
gtaagatttt tcgagcagtt cgagatgatc gtctcctcct ctttttcctc cttgagagtt    960
gcgagttcgg agcgtatcat tccagctctt cccgcagggc ttctttctca tagtcgtatg   1020
ccggtggctg tagaatgaat gtaccatctg cgacgtttct tcataccggc ttaccgacgc   1080
tcgatcggat gaagcccgtc cgaagcggcc tcttccgaga tttcctgtcc cgtgtttcgt   1140
ctttcttctc gaaatagtcg tagaggttgc cgagggctcc tgccggtggg attccttttc   1200
ttcatcgcgc cccagttcat agccttcagt ttatcgtcgg tgcagttcccc gtcggtggct   1260
tgcggaacgg tttcttaaga cctgctgtcc tctcttcctt ttgtcgctct tcggccgaag   1320
gaggaagatc agccataagg aaatcaggaa gaggatgcct aatccggcga agcaagcagt   1380
tttttaagct gttctttctt cttttcggac tgttctcttt ttctttctct tctttgtccg   1440
ctccctttcc cggggtctcc ggaaaaacgg atgcggatgt ttcggatgtt tttcattgtt   1500
catattcgat cgtattaagt aattttttggc gtaatgcttt tgcggaagtc gctccggccg   1560
aaggctgtcg tgcgaacggg actgtcgatc agctcgcgga atcttttttc ttccaccgtc   1620
tgtaatcgga cggagcaaag aaccggacaa tcataccgag cgaacacaca gataaatcag   1680
gctcagcccg aataccgcga tttttcgttg caggggctta aacggtcaca ttgccgcttt   1740
aggccgaggt gtattttcag atagaccgtt tcantcgttt cacggtttga atgtcctgat   1800
tttgcagcac ggtaaacgtt ccaacaggaa accctgcgga ttgttgtccg aacgaacgga   1860
atgatcaggc tgcattcggt gataagcgac cgctccgtga tgttgctctg gggacgataa   1920
```

```
actgccgggc gtaagtcctg acccgataag gataggcctc aaatcgcacc ggatggagtc    1980
gagctcgata cgctggtgga tattgcctga atcatccggc tgtaatatcc tttttccatc    2040
aggtctttgt agtaattgag gccgttttgt cggccagcat caaagcgcgt ttgacattcc    2100
cttcgatgcc gccttgtccg gcgcaatcgt aaagaagagt tcgtgaaaac gcctgagtgc    2160
tcgcgggctt ccacgggacg gttggctttg gcatcctggc tgagacgagc ataagcgact    2220
ttccgttgtc cagcacatag actttctccc gctgttttct gcaaaggaat aggatgaaaa    2280
aacggcatag cccgtgataa tgagcagagt acgacaaagg caatggcata aagccggatc    2340
tgccggaacg attttcgata tttttcaatg atttgaattc cataaagtaa ggtgttagct    2400
gtcgttgttt taggttgttt cgtcaatgct ccgttggtgt ttccaccgcc gaatcgcctt    2460
cggaggaacc tttccggaat cgcttcctga aacgtnccaa gcattacccg acaactgcgc    2520
```

(2) INFORMATION FOR SEQ ID NO:300

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 404 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...404

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:300

```
ccttcagcag caaatcgaag ttcggagcag agaaaagcac cttgccggca tcgcatcgtc     60
aaagtttttcc aatgccgact ttacatccgc ttcggaatgt tgatcccctc tttgactttg    120
aagatctgaa tcgggaagat gggtactcac catgccccaa accttcctcc gtggcacgta    180
acaactcctc catcacattc gaccttcggg cgaagtatca gtgccgtaat tgatggaact    240
gaataaacct gattgcctcc acgagagtgc atcgtattca agttgtggat gaagcttcca    300
tagcctgatg cgtatcctta cgcgtctttc ggaaaactgt ggcagagcga tctccacctc    360
tgtactcgaa aaagggaaag acgccgcaca tcgtccctca tata                     404
```

(2) INFORMATION FOR SEQ ID NO:301

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 451 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...451

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:301

```
gacaacaatc cgtacgaaga gagattcgaa gttgatgtag atggagccag ctcaccgtat      60
tcccggccaa aaaaggtcag gaaatagtgg gttacgctta gaaagctata cagacaaggg     120
ctttagcggt aagttcactg tgatgtagga ttcgatatgg atggcaaaat ccacgacttc     180
tccgtgctca gccacacgaa acacccggtc tgggagccaa gatgcaagag tggttccgaa     240
cgccgccaaa aaagaaggac tgatccaaga tgtacgtggt gtacagatga gtgaactcct     300
ctgactgttt ccaaagacgg cggtcaagtg gatgctatca cagcgcgacg atcagtagcc     360
cgagcctttt tggatgcaat ggatcgtgcc taagaggttt caaagccgct caaggcagtg     420
cccggacagg ctcaggagtc ttcgaggcag c                                    451
```

(2) INFORMATION FOR SEQ ID NO:302

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 458 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

   (ii) MOLECULE TYPE: DNA (genomic)

  (iii) HYPOTHETICAL: NO

   (iv) ANTI-SENSE: UNKNOWN

   (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

   (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...458

   (xi) SEQUENCE DESCRIPTION: SEQ ID NO:302

```
taaaaggact cttaagggac gactaaatat gcttttcaat acgcccatgt ctttctctat      60
tgtttcccaa gaatgaagct tatatttccc tgaaaacgat cttggacatc ttcaaacaaa     120
tacttctgat tagctttgag gctaagatat agtcggcctc tgattgaata atcacttcag     180
caatagctgt ttgtatccca ttgcatcaat actaacaact gatccactta aatcaagact     240
atccgtactt cgggaatagc ttgtaattca ttgtgtttgt ctgtaactgt ctctgacaag     300
acttaagctc acttgatcaa tccatgccga gagtatatat gtaacccagt cttctttggg     360
agctacgcaa acgcttgcca tctatggcaa tagtttaccc tctaaatcgc taatcaagtc     420
ttttccataa acactgagac agcgtaaaga gcaatgan                             458
```

(2) INFORMATION FOR SEQ ID NO:303

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 650 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

   (ii) MOLECULE TYPE: DNA (genomic)

  (iii) HYPOTHETICAL: NO

   (iv) ANTI-SENSE: UNKNOWN

   (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

   (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...650

   (xi) SEQUENCE DESCRIPTION: SEQ ID NO:303

```
agagtttatc atcaacctgc aaacctgaca ctctccatta tgctttgcgc aataatgaga      60
tagccattct tgccactacc gaaatatcat ttgagaaaca catatcgcct gacaaaactt     120
```

```
atccatattg ccagttgatt ctcaatatat agctctcagt gtccgagagc atttgtagaa      180
gttccttttt cgttatattt atctctattt atcttcattc gtatcggata atatttgctc      240
ataaatcaac accctaatgt caaacatata atacattcag aaaactttgt gtttacttac      300
aaactaaatt ggttttgaca aggaggttta tatctccttg tgaagacagt tatattattt      360
ctttgtattt atcatactta ttcccagtgt ttatacacat tctctaaaca ttgacgaaca      420
aaattgaggt tctcatgcga gagtttaact ctgagaagag cagctgttga aaaccttgaa      480
taatctcatt cttaaagggc cattttttgaa tatattaatg aatatatttt ttatctcaac      540
tcttttttgat tagtatcaag ttgtgtttgt acaatcatat ccactaattt acacatggca      600
tagcagaaac catactggat attttctaag caattagata ataattatct                650
```

```
gcagatcggt ttttgagccg atgattttca gcgtgtcgtc gggagtgaac cataccatcg       60
ggagtaaaaa atcacaggaa tacccacagc cgacccttca acctctccaa aatccggggg      120
tctccacggc ttttcggtcg ggaaaattca ttgttcggcg tgcaaacctg caaatcggac      180
acgaaattca ctgctcaact tggaggacga caaatccgcg cggaaaatgc ttcctccggc      240
ttggacgact ttttcggcc cgcaatgcag atttcctgtc ggacattccc tctttgccga      300
aagtacccgt atatcccttg cagagagtga aactgtcgca cggcttttcg tcgaatcctt      360
ttgccgcaga gtcgatccct ttattcgttg caatccgggc ttcggcaaat acggcttcct      420
tactccgtta atgctctcat tatttagaga atgggatcgg gaaaaataag agacacgaac      480
ggaatcttac tatcttcgtc ctgaaattat ggcagatcgt agaagaaccg atgacaatag      540
ggtgcgagag aggtggtatt gctgctgaat atcggctcgc cggacagcct gaggagaagg      600
acgtggcgcg ctacctcaat tcttttctga ccgacagagg atcatcacct tgccttttct      660
cctgagacag ttactcgtga gaggtacatc actcctttca gaaagaaaag ttcggcacaa      720
aaatatcgga ccgttgggac gaaagcaccc ggtctttccc cctcatatcg catacgaaag      780
ccatgcccgg gcactggcac atacgggcag agaagtccat gtagccatgc gctcggcaag      840
ccggctgtgg ccgatgtgct gaaggagctg ccacacggcc gagcctcgtc gtcctcccgc      900
tcttcccaca ctacgccatg agcagctacg aacggccgtg gagcattgca aggccgaaat      960
ccgccgcctt tgtccgaatc ttccttccgc gtcgtgcagc ctttctacgc acacgaagcc     1020
tatattcgtt ccttgccgat aacatcagac cctatctgac gaagcctttc gacaagctat     1080
tctttcctat cacggcattc cccgcgatca tttggacaag accacccaca ggctttgaat     1140
ctccggcatc ccgaaggatg ctgcacggag gaggatctac ggcaaacgtc tgctaccgct     1200
atcagactta caggacgacg gctctatccg cgaggcactt ggcttggccg aggagcaggt     1260
ggagcaggtg ttccgtcacg tgtaggccat accgaatggc tgcgccctat ttgatcgaac     1320
gacgtccgct tggccgcaag aggaaacaaa acgtatcctc atagcctgcc cccccttcgtg     1380
tgcgactgtc tggagagcct cgaagaagta gccgatcacg gcaaagcatt ttcaaaaaag     1440
caggaggtgc ggatttcact tacatcccct tctcaatagc ggggcgaatt ggatcgatgc     1500
tctccgaaac attttagaga ataatacagc atgctcagtt atcataccga tataccgaca     1560
gacctgccct cctgaggcaa gccgtcgaag ccatccgccg ggaagaatcc ggcggtgcgt     1620
acccgactcc gatcggccga gggtgatata cgaggcgcgc aaccggttta cgccatccgt     1680
accgcacagg gagagcaggt ggtgaagagc ttccgatccc tattgccatt cagcgcgtgg     1740
tctactcatt cttccgcccc tcgaggctgc tcgctcttat cgcaacgcca tacggctggg     1800
gcgatgcggc atcgcactcc gcgaccgtcg ggctatgcca tcgaacgcga aaaagggctt     1860
cttgcaggag ctactacgtc tgcgaaagca tgcacgactg tcgggatatt ctctctccat     1920
gcagggagtg gaaggaggcg aggccttgct ccgtgcgctg ccggattcat cgcccgaatg     1980
caccgagcag gcattcatca cattgatttt cgccgggcaa cgtactgtat cggacagacg     2040
```

```
agaaaggcga gtattcgtct acctcataga cctgaaccgg atgaagttct acgacaagcc    2100
gattgtgggc ggaaagccta tgccaacttt gcacgtctga gcttttgtcc ggcagtagca    2160
agcagcttgc cgaatattat gcagaggcac agggcttgaa tacggcggag tggtccaagg    2220
ggtacaaagc gaatcggatc ggttcttccg cagcaagtcc gcaagtatgc tcgcaaggca    2280
ttggtgcgcg aacaaaagcg aatagccgct ccgctttccg tcgggcatat atccgctatc    2340
gctcggtacg cctatccgaa aactcacggg ctgcacccgt ctcttccgta tcgagaacga    2400
ttgtacacat cctatcttga agtgggcgac ctgcgccata cactgaaaag gccgaaggat    2460
attcctcgcc gaaaaacgtt caataagaaa aaaggaaacg aatgaatcgt atagcttttg    2520
atgccaagag aatcacatcc aacgccacgg gctgggcaat tacagccgct tcgtggtcga    2580
agccttggcc gcctttcctc cgaacaccgc tactacctct gttctcccgg gaagggcaat    2640
ccggcttgta ctccgccttg cagc                                          2664
```

(2) INFORMATION FOR SEQ ID NO:305

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 908 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...908

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:305

```
tgctcaacaa agcagccaaa gctcgtatcg accagtatac caaaactgcg gtatcggtta     60
cgaattgcta tataccgagc taaccattta tttctcagtg gacgtgtctg ctcattcaac    120
gacaagcaag tgcatagcgt actggaggtt caggcgtcaa acgcaagtct tttgcaggag    180
ctaccgagtg gtattctgcg acttagcaac cgtcaagcgt gccatctcag ccatcaagga    240
gggcaggata gcttgggggc aagcgaagtg acgctatctg acaacccat tatttgcgtc     300
ctgagcagaa agaagccatc gagcgcacgc tcaagcagtt ccgaaaggaa ataagatgct    360
gtggaatgcc aagatgcgtt ttggcaaaac gcctgtgccc tgcgtgttgc caaagagatg    420
gaagctgtgc gtacgattat ctcacgcatc gcccggtggt agatgccagc tggtttgagg    480
actttggtaa accttctacg accgtcctga gtggcactat ggctcccgta gcaaaggtgg    540
agcttcgctt ctctcgaaaa gcttgcttcc caaggaaaa agtgtgtcat tttgcctcta    600
tgcaagatat gcgtggttcg aaggacgtag gaggtaattt gacaaaaaca acgaagtctt    660
ctctacttca tgggatttag tgattgggac gaggcacacg aagggacaca gaccgagctg    720
gggaaaagcc gtattggtca gttgatgggt aaggatacaa aggcatttac atctatcggg    780
aacacttata acctcttcga tcagcacaaa gaggaggaaa gtctttacgt gggctatgtc    840
atgggaacaa caagccaaaa tcgattgggg aantcaatca tctggcgaca cttacccct    900
atgcctta                                                            908
```

(2) INFORMATION FOR SEQ ID NO:306

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 1323 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
    (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...1323

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:306

```
cggtgccggt atcggttgga cgatggcaca gcgtgtcaag atgatacagt gcctcagatg    60
gtggccttgc ttaacggtgt cggaggggct gcttccgcct cgtgggggatt ttgtctctcg   120
cagctatagg aatcaatccg aataatacac ggctgccgac tatccgatct tttcgcaagc   180
taccggtatg ctggcatgac tgtcggtatg attaccctca taggtagcct tatcgccgcc   240
ggtaactaca caaactactg cctcagagac cggtgatatg gcctaaccac tcgagtttac   300
ctctttgcta ctgatcctga ccgtgggatt cgtggtgctc ggtctgtttc tatcgaaggg   360
tttcccctct tctgggctat catcggagga ctttttttctc ctctctcttc ggtttgttct   420
tctctatccg tgtcggtgga gggatatgcc tattaccatt tcgctactga actcccttag   480
cggtgtggcc gagccattgc cggtatggct gtgggcgata ttctactcgt agccgtaggg   540
gtattgtcgg tgccagtggt ctgttgctga cgcagattat gtgccgcgca tgaaccgcaa   600
gctcatgtcc attctgatgg cttcgggagc aaaagcacac ctgccgctac aacgccgact   660
actgcttcaa aacaagaaaa aggagagttg ccgctcctgc tcctgccaaa gcagagaaga   720
cagccggtag cgtacgcgcg atgccaagcg agtcatcatc gtacccggtt acggtatggc   780
attgctcagg cacagcacca agtaagacag ctggccgata aacttacggc taaggtacgg   840
aagttcgcta tgccatccat ccggtggcgg gtcgtatgcc cgacacatga acgtgcttct   900
gtgcgaagcc gatgtgccct atgaccaact ctcgagatgg atgccatcaa cggagacttc   960
gctcagacgg atgccgtggt gtaatcggtg ccaacgacgt aatgaaccct gctgctcgca  1020
atgctgaggt acgcctatat acggtatgcc cgtgctgaac gtggacgatg ctcccgaata  1080
atcatttgca acttcgacct gaaacccggt tacgcaggtg tggacaaccg ctctatacac  1140
gagcaacggg tgtattcctc aaactcggag atgccaggaa tctctggcag agatcatgaa  1200
ggaaatggat gccacaggcg atacgcagct actgctgctc ctgccaaagc agagaagaca  1260
gccggtagcg tactcgcgat gccaagcgag tcatcatcgt acccggttac ggtatggcat  1320
tgg                                                                 1323
```

(2) INFORMATION FOR SEQ ID NO:307

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 529 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...529

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:307

```
agaggctcta ccttttcatg ctacagactt ttctgccact cctgctgata cttttgccat    60
ctgttggttt gtggttttga tgcagtttct gtggaaattg tggacgacat ggtcggcaaa   120
ggactgagtg ccatcatctt gtccaagtgc ttttctacgc agccatgacc ttggttccca   180
tggcactccc gctggggtcc tgttggcctc attgatgacc ttcggaaatt tgggcgaacg   240
cttggattgc tcgccatgaa gtcggccgga gtaccgctct accgcatcat gaaactcttt   300
tcttctctgt ggtagccatt gcttgcgggc ttttcatctt tcaaacgatc tgatgatcca   360
gtcccaagtg aaattctaca cgatcctgtt tttgcgagaa gggcgactcc ggaactggaa   420
attcccgaag gttctttcta catggtattc cgtgggtaca atctctttgt agccaagaaa   480
gatcgccgca gggaatgctc cacgacatga tgatctatga ccactcttc                529
```

(2) INFORMATION FOR SEQ ID NO:308

    (i) SEQUENCE CHARACTERISTICS:
       (A) LENGTH: 992 base pairs
       (B) TYPE: nucleic acid
       (C) STRANDEDNESS: double
       (D) TOPOLOGY: circular

   (ii) MOLECULE TYPE: DNA (genomic)

  (iii) HYPOTHETICAL: NO

   (iv) ANTI-SENSE: UNKNOWN

   (vi) ORIGINAL SOURCE:
       (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

   (ix) FEATURE:
       (A) NAME/KEY: misc_feature
       (B) LOCATION 1...992

   (xi) SEQUENCE DESCRIPTION: SEQ ID NO:308

```
ggatgccatc gacgaaagta ttatcggtag cggtatcatt cgatacgaat aagcgcacgc    60
ttcatttatc cctcgccgtt ggatggagtg gaatcttaaa ggatacggac aagacttctg   120
ccgaccttgc cataggagac attcagacaa gctgaagccg gacgtaacac ctctccccgg   180
aggaggagta tcattagctg gaaagttcct ttcttaagcc agttggtttc ccgattcgga   240
gaaagcccaa tcctgtgttc aaaacccttg gaagtgccct atgtttctgc cgcaccgcac   300
aaacccccaa tcctcccgtt ggcgtagtca ttgcagacaa gttatggccg gtacatatcc   360
cgaaaaggct gctatcgctg ccgtttatgt aagccatccg ctccggactc tactttccac   420
ctcttctcaa gagcaacaca acagaagatt gcagaaggtg acaactccct ccgattggca   480
ggccggaaca ggttgaggat caatttggat aagccgttcc cggtgaataa tgaccatatc   540
ttttttgccgg tatcagaatg cctaataagt acaagctcaa tcgtgctacc gttatgtaag   600
aaatccggat aaccttttct ccattaccgg taagaagttt catataacaa cggagtctct   660
ttcgaaggct acggaatacc ctcgctttgg gctatatggc tatcaaatat ctggtggtaa   720
ataccgatgc tccgagatcg atatgtcgct tgtacaggag ccttatgcta agggaacgaa   780
tgtgctccat tccccgaatt ggtcggcata tatgtctata agaacggaac attatcggca   840
cacaggatcc atccgtcaca acttattcgg tttcagacng aaagagagcg atgaatacga   900
aataaaactg ggtatataag gggatccggg ctttcgaatg ggcgttgctc aagattgaga   960
ataacaatgc tgtccgttgc tatccgtctg tt                                 992
```

(2) INFORMATION FOR SEQ ID NO:309

    (i) SEQUENCE CHARACTERISTICS:
       (A) LENGTH: 2585 base pairs
       (B) TYPE: nucleic acid
       (C) STRANDEDNESS: double
       (D) TOPOLOGY: circular

   (ii) MOLECULE TYPE: DNA (genomic)

  (iii) HYPOTHETICAL: NO

   (iv) ANTI-SENSE: UNKNOWN

   (vi) ORIGINAL SOURCE:
       (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

   (ix) FEATURE:
       (A) NAME/KEY: misc_feature
       (B) LOCATION 1...2585

   (xi) SEQUENCE DESCRIPTION: SEQ ID NO:309

```
agtgtaaaat gaaaggataa aggggataaa gggcctgctt attgcgaaag tcttcatacg    60
acaaaagcaa atcctgaaga tcgatctgcg gcgaatggga aggaagagga agggaggggc   120
ttatttgggc tgttgcccca ttgccttcga agttgtaggg gtgtattgcc gagcatcttg   180
```

```
cgacagaaag cacagagtag ctgacagagg agaagagatt cttttccgct attgccttga      240
gagacgagac ggatcggcca agtctgtgta gacatgcttg gccctttctt catgatccat      300
ttgagtggcg gacaactgaa ttcctgattg aagtgacgtt tgaagaactg agcgacagat      360
tcattttggc tgcaagctct tctgccgatc ggactccaaa tggtgtcgga atacgaaagc      420
acgaaagccc ttgttctgac atggaatgag gagagaaagt tgtctaaaag cggcttttcg      480
tagcgtgagc gaagatgcag aagagttcgc gcagtttcag ctcgaatatc tcggacgaat      540
gggcatttct gacaaatatc ccatcacaga gtggagccag gagttcacat tgtctctcgt      600
tgcaaggagg agatgtgaac gatttcggtt cgtctccgca ttctttctta ttgcccgaag      660
agggacaaat gccgaggcat aaatgggcgt gggatggaaa taaaagcaaa tgagcgtagc      720
cgggcctttt tcagcctaag tcttatacga agattggcag ccaaaaggac aacattatct      780
cccgcaattg cgaattaccg gattccggcc cgacaaatac ggccggctct ccttgagcag      840
gaagagcaaa gcatggctgt ctttggtcca gatttccaaa tcgctccttg tcctaccgtg      900
tggagttcgg gcaatccgga cagagcagtg gcggtcggct gttgttcagg atgccattcg      960
gattttcttt gggagagaca gctgacagat atgaatactc ataaggagga tggtcgggcg     1020
ttatctttgc aaagcgagct attatgtgac gagctgcctt gtccgaggta ttgtccgtcc     1080
gatgcttttg cggatggagt cgtatccgga caactgtgct tgtcgcttgc ggacgaagca     1140
tcaaggagcg gagacaaact tgcggccaac cttttcccgt gaacaaggct ccgaaaagtt     1200
cgggcactac agccctgccg gcaataggtt ggtcagcgaa ataaaaggcg taccaaagca     1260
atacttgaaa atcaattggt cagtcgacct cctcgaatat agtagcatac gacctgtggc     1320
gtacgatcag tgcggtttcg agcgtagccg ttcctgaagt tacgagggct gcttgctctc     1380
tcggagtatt tcatacgtgc gtccgaatac aacgggaatg cgtcgtcggg caaaaatgga     1440
gtatagtcct gtatcgtcag tccgggtgca cggctatgac agggcggtag tccgggaatt     1500
gcttcatcac acgcagcata caggcaaatt ctccttcact tcgagcaagc gacttccaca     1560
gagaagggta cttgacgaga atctttggct gaccgctctt gctcttcgat cgtaggcgca     1620
tgtgttgctt gacggcatca tagcacggat tgcctacata gatgacggaa aatcgtgtcc     1680
ggcaaaaaaa tctttctcga aaggcaagat gcagacatga gatcgacgta tttcttcaac     1740
gtcttgattc gccaggattt ccatcccaga ccttaggaga gatataatag actatcggct     1800
tgccaagctc ttccgtacaa acggaagtac gtagcgcata ttgaagcccg ggtagtccac     1860
tggatgacaa cgtcggggtt aaatgctcgc atctgctcct gcacatgttc gccgcgcggc     1920
ggatgacacc gaggtgcgtg agtaccggaa tgaagcccat aaggctactt ccctgtaatg     1980
aaagatcggt cgctctccgg tagcctcggc aagaaatccc cccccatgaa tgcaaacacg     2040
gcttccgggt catgctcttc aaggcacgaa ccagattgga tgcatgcagg tcgcccgagg     2100
cttcgccgct acgatgaaat agcgcatacg caataaagaa aatcagggaa aggggaagga     2160
gatcagacgc tcctcttgag aagttcctcc aagacaggta gataagtctc gaagtcatat     2220
tcagtttgat gggagatagt gtaacgtagc ccgctgcatc agttccaaat caccctctat     2280
ggtgccttta ttgatctgac gtctgtcatc caatacacag cattgccccg tgcatcttcg     2340
gaagccatgt atcgtcgaca aaacgaccgt ccgtaacggc gcaaggcttt agccccaaag     2400
gtttcccttc ggaacattca tgcttagcat cgtgtcctga ggcaagccat cttcaggatc     2460
atacgactga catgcacggc ataggccgtg gcatgactct atcgcaaatc tcgctatggt     2520
cgtccagcga aacggccaga gccggcactc acacacacat ccttccatcg cagcacccac     2580
cgtgc                                                                  2585
```

(2) INFORMATION FOR SEQ ID NO:310

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 440 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...440

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:310

```
cagctcctcc tgtcgctcaa aaaaaacctg cagcagcaca gtatcatcac gaaaccacga       60
acacgaacta ccggcaagag ttcgtccaac ttggcacgag atgagtggta agctttcctt      120
```

```
cgaagaatgg aaagaactgt accgccgatc gtattctggg agatagaact ggaacaagcc    180
gacagacaga tgggcgactc ctcgaaatgc agaaacagga agccaaccgt ctctttgccc    240
gattctcaca caaaactatc gggaatggat tgccaagccg gatacacgtt cgacatgagc    300
ccggatcttt tcaaacaaaa ggtattcccc ctactcgaca atgcgaaaag gtattcttca    360
tccttcatag acaacttttc ggcaggatca gtggagagcg tgaaatccat gctcagcgag    420
ttttacacct tcgaagaaga                                                440
```

(2) INFORMATION FOR SEQ ID NO:311

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 1872 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...1872

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:311

```
ggtgaagatg tagtcaataa gaacttcgcc gcagtggatc gaggtggcgt gtggtagaga      60
taacggtgaa acccgaatgg gctgacctgc ccgacgatcc gtggtacgcc acgagggaga     120
cacggacttt gtccacaacg tggtacgccg atcaacgcac aagccggaga cgacctcccc     180
gtatccgctt tcctcgacgc gaagacggta catggattc aggaacggcc gcttccgaaa      240
aacgcgtgtg gcagctttcg ttcctgtatg ggaagctgac aactgtgtac agtgaaccag     300
tgtgcctacg tttgtcctca cgctacgatt cgtccgttcg tcccaccaag gaagaagagg     360
agaaaaccgg cgtcaaggtg ctcaaggctg tcgaaaacag ttcccagaca tgggcttccg     420
cattcaggtg aacgtaatgg atgtctcggc tgtagcaact gtgtggatgt atgtccgggc     480
aataagaatg caaggctctg accatgcagc ctatcgagga gcagtacgaa gaaccaaaaa     540
actgggataa gatgatctcc ggtgtgaccg gcaaggctca cttggtggca tcgcagccaa     600
tgtgaagaac tcgcagtttg cgacgccgct ctttgagtct cgggtgcatg ttccggttgc     660
ggtgagactc cctatgtgaa gctgatacc agctctatgg agaccgccag acagtggcca     720
acgctacagg ttgttttcca tctactctgc ttcggctcct tctacacctt cacgaagaa     780
cgaggcggcg aaggcccggc atgggccaat tcattgttcg aggacaatgc agattcggtc     840
tcggtatgca cttggcatat aagaagatgc gtcgccgcct tggaatcttg cagaagaagc     900
tcagcagtct ccctgctgtt cggacgagct gaagctctct tgagagaatg ggtagaaaag     960
cgtcaggatg ctgtcgccag aaagttcttg ccgataagat caaacctctt gtcgctgcct    1020
gcgattgtgc atctgcaaga gaatcggccg tgtcgattcg ttcttcatca agcgtgcaag    1080
tggatcatag gtggagacgg ttgggcatac gatatcggtt cggtggttg gaccatgtga     1140
ttgcatccgg tatgaatgtg aatatcctcg ttctcgtaca gaggtttatt ccaatacgga    1200
ggacagtcgt ccaagagtac tccgacggag ctatagccaa gtttgccgca gccggtaagc    1260
gtatcaggaa gaaaacctcg gtatgattgc ttgctacgta tggctatgtc tatgtggcac    1320
aagatctatc ggagccaatc cggcacagac gctcaaagct atccgcgaag cgaagcctac    1380
gacgggcctt ctatcgttat cgcctactcg ccctgtatct ccacggtatc aagagcggta    1440
tgggcaagac tcaggccgaa ggcaagagag cgttgagtgt ggctactggc acctctggcg    1500
ctacaatccc gaactggaga agagggtaag aatccgttcc agatggatag caaagagccg    1560
aactggagga attcaagaac ttcctcaaag gcgaagtccg ctatgcatcg ctgtacagga    1620
attccccgag gatgccgagc aactcttcga cgctgcgttc gaaaatccca atggcgctat    1680
cgtaactaca tgcgtatgag tgcggcagac tggtcttgcc tcttggtatt caggacatca    1740
aggaagaaaa agactgcgat cactagcgta tctacgccct tataacaaaa tcgaggctgt    1800
gcagctaagg atttattctt agtggcacag cctcgattgt ttctattcct acccgtattc    1860
gtcctgctca aa                                                       1872
```

(2) INFORMATION FOR SEQ ID NO:312

    (i) SEQUENCE CHARACTERISTICS:

        (A) LENGTH: 342 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...342

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:312

```
ggtcttgctg gtggatttgt tttttaagac tatacaagac gtaaataaa aagcaccttt      60
cctcccggag aagtgctctt tttcggtatt tctatgaatc ctaccgactg cgatcgattt     120
atcactttta taatggttac atcattagac caaatggctt tggctaaaca aatgtgttac     180
tattacattg gcaaagtata gccagccatg catctccaca ataccgatta ataagtaaaa     240
ttatttgtag gctacctaac catatggcta aatggatatg actttcaaga tcttccgatg     300
tgaactaaat aagctgacag tcaaaaaagt taattcagct tt                       342
```

(2) INFORMATION FOR SEQ ID NO:313

     (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 757 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...757

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:313

```
aggatccccg cttgaagcta ttgttcgtac atgtcgttcg agtagtcggg catcaagctt      60
aatcttggcg ctttgggcgt aaagaccaac tcccaaaagg acgccgcgat cagcaataat     120
aatttcctca tactttaaaa caatttaggt cgtgattcag agaaccacgg ccgggttaaa     180
aaaacaaaaa aaatcccaaa taagattcat ttcaagaaca atccaagaaa agaaaaggaa     240
tttaaggcaa aatgctacct tctatttcta ttggtacttt tctcaaggag ttttttgcgg     300
cgcaatttag agaaaaaatt cgatttaaga agagtatcgg atttaaagaa catgttttca     360
atataagcga caagggatta acccttataa aagctgtcaa ttagcctttt gccaaaatat     420
tgactgtaat ctgaaggaga aatgaaagag gaaaaggttc atgctccacc tcattaaaag     480
tcagagtctt taaaagtgtt gtctaacaac acttaaagtt attgtgttgc atgtatttaa     540
accgaaaagt agagcagacc aaggttaagt cagtccagca tgaggaagga gcggagggga     600
aaggggaaaa aagatccttg actaaggagt cgggggttga tgtggaagta aagagttctc     660
gggctgtaca ttgttcgaaa agacaaacgc cccttactga tatgataggt accattatgc     720
tgagagaaaa gagggcacta tatgcgaaag agtaacc                             757
```

(2) INFORMATION FOR SEQ ID NO:314

(i) SEQUENCE CHARACTERISTICS:
    (A) LENGTH: 1324 base pairs
    (B) TYPE: nucleic acid
    (C) STRANDEDNESS: double
    (D) TOPOLOGY: circular

(ii) MOLECULE TYPE: DNA (genomic)

(iii) HYPOTHETICAL: NO

(iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
    (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...1324

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:314

```
gactctagag gatcccacgg atgacatccg ctacatgcgg atcgcgctca agaggcacga    60
gcggctgctg acgaaggaga gattcctatc ggagccgtat cgtctgcaaa gggcagatcg   120
ttgcgcgtgc tcacaacaga gtggaaagct aaacgaccct acggctcatg ccgagatgct   180
tgccatcacg atggcctaga tgccataggg gggaaatacc tccgcgactg cacgctgtac   240
gtgacgtcga accctgcctg atgtgtgctg gcgcacttcg ctggacacaa atacgcgagt   300
agtgtacgga gcatccgaac ccaaagtggg ctacaggctg ttcccgatca tgcactccat   360
cccaaatgcc acgtagaagg cggtatattg gcgacgaatc ggagaatctg atgcgtagtt   420
tctttgccga acggcggtag cgagcaacac attatatatc tttgtgcaat atggcagcat   480
tcagtgtaca atattgggct gcggatctgc cctgccaacc acacaccacc atccctcttg   540
caagtaatcg acctgcgcga caaactctac atgatcgatt gcggagaagt gtccagcgac   600
aattcagaca cgaaaagctc catttcggac gtctcatcat atcttcatca gccatctcca   660
tggcgatcac tgttttcggt ctgcccgatt tatctccacg ctcggtctgc tggggcgtac   720
cggcaccctg catgtcatgg gccggaggga atagagcgtt tcctcagccc catattggag   780
cagtctgtca ccgaatgccc tatcaggtgg agatacatac gatcgatgcc tccgacatgc   840
gcttgtacat gaggacaaat ccgtcaaagt ctatagcata ccctcagcca ccgcatccct   900
gcggtgggct acctcttcga agagaaatgc ctgcaaggca tctgaacaaa gcggctgccg   960
agttctacaa tattccgctt ccgaatatcc cctcatcata gaaggatccg attacgac   1020
accggatggc ggatcatccc caaccgacac ctcacgaccc cgggtacacc acccagacat   1080
atgcttactg ctcggacacg gagttttgtc cctccatcgt ccctattttc aaggtgtgga   1140
tttgctctac catgaagcta cttttatgga ggaggacggg caagagccaa agagactttc   1200
cacagtacag ccaaagaagc cgccgaatag cacgacaggc aggagcaaaa cgcctcctca   1260
tcgggcatta ctccgcagat acaaggacgt ccaaggtttg ctggaagaag ctcaaagcgt   1320
atta                                                               1324
```

(2) INFORMATION FOR SEQ ID NO:315

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 1803 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...1803

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:315

```
aatgcatcca gatttagcgt aaaaatctca ttcttaccct gtattcatta accgcttctt    60
aggctcctat agaaatagtt gatctttcta agtgcttctc tagtgttttc gcaggtatat   120
aaaaagaata tccataacaa gcacagctgt atcaaaataa tcctcctctt cttttccatc   180
tctcagggat atgataaaga gccaaacccc ttggattgtc tcgcaccaaa gttatggagc   240
ataaaaagtt ggtgatgaga ttgttcacct cttctcttag tccagcattc tgaagcgtat   300
tacccctcta actggagtat tgacaaatgt tgctaattgt acctctgcca gtttctcttca  360
aatattcttt tttattttt tatttggtct gggtgtcacc atgctttata ttaggttctg    420
atttagcctt gtcctcatta gaaagtaaga agtcaagggg agcatctcaa cctcttgcac    480
tcctaacttc cttgtgcgag gctttttaat ttatctattt ctttcgggtt actactcatg    540
gcaagaaata ctgcactttc gcatcaggc ttagcttaaa agagagttgt agttcaaggc     600
tccttcttgt ccggggatga gacaaagctc caattttcac ccttattccc tttctttttc    660
tcttcctcat acactctgcg agcctctcat ctttatttg aaagtattct atcccccttt     720
cgataaagtt ttttttgttg tcgaagcagt tttctttaca aacctcttgc ctatctgtgt    780
caagtaaact tgtcgagctt cggtttgacc tcggaggcgc gcagcgttgc cccgcatccc    840
tggcctggaa gtggatgatg ggcgtatgct gttccaattc aattccaact tatacatcgt    900
ggtctatgct ttttgttttg tattgtcctt aaatagactt ccatgagtcc cttattggtc    960
tcaagcaacg attcggagaa ctctgccatt tattcaaatc ctttgttctt tctcgttcta   1020
attcgaacat gttttgtctc gtaattcctc ctttttgatt tttaatttgt agctccatta   1080
atggctacga caataattgt ggcagtggct actaccacaa aacagagaag attaaagttt   1140
ctatttccat gctattttct gtatttgaaa taatgtttat tgggaagtag aggcagatgg   1200
caaatactat aagcgtaata atatcccacc caatagcccc catgtcgagg acaagggtc    1260
cccgatattg aagagcgagt gatgcatcct ttttcaacaa aagtgttgat gcctaaaaag   1320
ccacaagtaa cgtgataggc aggtagaggt tggcagtttt gttgagtaca cctgttcctc   1380
aagggttgtg tagttaaaga gttcgcccat ctcttcgtcg aggctttagc atctttctcg   1440
atgttcatat tgctttgaag catatcgtac tttctatgcc ctgtatttga ggggtaacct   1500
ctcgaaagta ggtctcatta gaaagcggat atagttgccg tacagctctt tgacctgctt   1560
ttcggttttc tctttgtctt cttgtccaat atcagttgtg tgatagaggc tatttcgtgc   1620
tgaagcgtag tatggtggag cgttgcacaa ggctcaatgt tgccattggt agtacatagt   1680
tgtaatatgg tctcccataa gttcccaacc tgaaaaccta cgagagagtc tttggttaga   1740
ccaaagagag taccttctcc cgacatcttg cataggttgt tctcctgaca tcctcccttt   1800
gta                                                                 1803
```

(2) INFORMATION FOR SEQ ID NO:316

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 1514 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...1514

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:316

```
gatagagata ctcttgagaa ggattgattt ggaagaggtt ggccgaagct ttccggctat    60
tttgccggag ctgaacggta ccacatagtt gatacctctc gatctgcata gcgtgatata   120
gccgctatct ggtcattgga ggctcctcga taataaggtg acagtcattg agctcaccac   180
tgtggatcac atcctcgcat cagacgtatt cgatacatcg taaacgcgca aagtcaccga   240
cactctctct tcttcagacg attcagcccc atcagcatac cctcgtagaa ttcccatatc   300
gctgggtatt gcccgataga gggagcatca gtccgacctc tatgcctccg actgcgatgt   360
cgtaggggag gaagccatag ccgtggaatc gcgccgggga tgcgtagttt gtggcctgca   420
gggaagttgg tagcagatat accggattgg ctttcatcag ttcctcttcg ctcaatccat   480
attttctgct atggagtaga gcgtttcctg tggccggata atgtgttcgc tcggatgaca   540
gcggcggata ttttgctatt ggcccggacc ggtttggacg gaatgagcga gtctgccctt   600
ccttgatccc ttgtctggcc gaagggttga gcgtataata tcatcctccg acagaccgta   660
```

```
ttggcgcgcc agtccataaa cggtcttttg gcttgcacta cgtgtacttt tgtcctgcta   720
cgcgtctgac cggatccgat actacggaca tcagcacaca cgtaatcagc aggatataaa   780
gacctttatc cggaatacat gatctgtcat ggtttccccc tttctttttt agtctattta   840
ttattaggtg agatggggca aaggtaacaa taacgactct gcggcaaatg gttatcctct   900
ttgcaatctc catataagag aactacgtgg gttaatgtct tcgttataaa tcaagccatt   960
tcaatatcga aagacatggt gcttaaggtt atcccggatt ggtcattgga aaagtaaggc  1020
ctaacgacaa ttccccgggt ttatcgactt cagtcggttg ctattgattt gggttgtgag  1080
cattcttgcg cgtgagcatc ttcgagtccg tgtagatgtc cgtacttctg cgagctgcag  1140
tattgcaaag gtgtgatgga agcagcaata agcaattgct tctgaatgcc cgaagctgca  1200
atcgaatacc ttagaaggcg atgcgcataa cgaggccgga aactccgtat ataaggcgat  1260
aaatttccgt atatagaaaa tttatttccg tatatacaca aatttatttc cgtatatacg  1320
aaaaatattt ccgcatatgc ggaaatctcg ctaccttcgt ggtgcgataa aaagcaatca  1380
aatcgagata gtaaagtgtt taataaccag ataattaagt tattatgatt aagattaaag  1440
caatcgaaag aaaggccgga ttcggcaaga cagcaaacgc ttggtaccct gcaatcactg  1500
cattcgatgt gaag                                                     1514
```

(2) INFORMATION FOR SEQ ID NO:317

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 626 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...626

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:317

```
ggatccccgg gaaaaccgct gtcattgtag taggagcagg tccggcaggc ttttcgcagc    60
actccggctc atcgagcttg gtctgaggcc tattattcgg agcgaggtaa gtccgtacac   120
gaaagaagag cagacatcgc tcgcattcca aagaggggca cgtagacccc gaatccaatt   180
acggatttgg cgaaggggtg ccggagcttt ttctgacggt aaattataca cacgtagtaa   240
gaagccggag atataaccaa aatactacgt attctctgca aacacggagc acagcttcta   300
tcctgatcga tgcgcatcca catatcggca ccgatcggct accaaagtga tagaaaacat   360
tcggcaccaa atattggcag ccggaggaga agtcacttca gttgccgaat ggaaagcctg   420
atcatacata acggtcaagt ctgggagcaa gagacaacaa ggggcgtgaa tactgcggtc   480
ctgttatcct gcaacgggac attccgcacg cgacatctat cgctatcttc accgaaacgc   540
attcgaatgg aagcaaaagg aacagctgtc ggtgtccggc tggagcatcg cagcntctga   600
tcgaccaact gcgctaccac aacccc                                        626
```

(2) INFORMATION FOR SEQ ID NO:318

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 1128 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:

(A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
(A) NAME/KEY: misc_feature
(B) LOCATION 1...1128

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:318

```
gccacatagt tgtgaaaagc ccggacaaag agcaccagcg aaagcacgta accaccattc      60
ccgcaagaaa ccatgccgta ccgaacttga acgggacgaa acggaaagca ccaatatggc     120
aatttgcagg attgtactga cagaggcttc gccttgtctt tggtcgtgta ccacgaggta     180
tccaccgcgc gctttctccc tcacggaaga ttgccatata tataaactgt atcagcacca     240
tgccgacgaa ggtatccatg cgttcagcca tccggcttgc aacgtggtga aaaagaaaaa     300
tcactcatag tcatcgggaa tgatattgtt tttttaatgt gatagcgata cggcaaaaat     360
cagggtatac accagattgt tccatccgcc cgtatcaaca gaagaaacgg ttgcggcagc     420
gttttccaaa ggaaattgag cagatggtga tcaacggtgt tgcgaaaact atccaacgag     480
gaaaagaagt tgcttttgca gcaccaatac agaaaagagc aaccatccga ttcccattag     540
aaaaaagaaa aaccgcccaa ccagccggca taggagagaa aatggtcgtg atttcgggat     600
gtccctgcga cgatacgatg ccgaaagccg ggaagaagca tgataagcac ctcctacaat     660
tatacttacg gatagggaag caagcaccag caggctgttt ttcgtcgcgc tttcttaacc     720
ctgagaaaca aatggagaat ccgatgatgt acagaaccgc cgccaacggg cctattatcc     780
ctccgcaatg agacgctcca agggcactgt gcccatagaa agcagcagat cttttcccga     840
tcgggaatgg gttgtgtcgt aaaatacagc aacatgtcgc cgtatacatc agcaggctac     900
ctgccactcc cacataccct gtcaatctga gttcttatcc ataccttttt cttattattt     960
gagttcgcaa aaatatacaa tagaatatcg tttgcaatcg ccaatagtgg ctattttcac    1020
agcccggaac cctatttctt agggtttgtc gattcgtcaa tcagtaactc atatcctcaa    1080
attcaacctt taataatctg tttggcattg gctctctgcc ggattgca               1128
```


(2) INFORMATION FOR SEQ ID NO:319

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 2750 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: double
(D) TOPOLOGY: circular

(ii) MOLECULE TYPE: DNA (genomic)

(iii) HYPOTHETICAL: NO

(iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
(A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
(A) NAME/KEY: misc_feature
(B) LOCATION 1...2750

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:319

```
aactccttta tagcggcatg atccggtgtc tgaccagatt gcgccggaac gcggtatcct      60
cattggaaga gtcccgtacg ataggtgatt ttttggtcag cagataagcc tctatctcat     120
cccgtgtggc atccagcagg gggcgcagat accatcgttc cgcttatagg gcatcccgca     180
caggccgctg attcccttcc tcgacagaga ttcagcacca tggtttcggc attatcgtcg     240
gcatgtgcgc caccgccacg tattcgatag ccagttcttt ccgcaactgt ccgaccattc     300
gtaacgcagt tctcgagcag ccatctcgat cgaaatcgac cgccgcgagc ataacgaacc     360
gtgtcgaagt cgatccgatg gagcggaaca tcagatctcg gcataggcgc tccacgaaag     420
ctgcatcctc atcgctctct accctcggag gtgaaaattg cagtgtgccg ccaccgtctc     480
ataccccaat cgcgcaatac gcagagcaga gccaccgagt cggcacctcc gctgagagca     540
ccagtacgag gcggtctcct tctcggaaga gcttccgctc tctgatcgcg ttcggacacg     600
gtttgtcagg gaaatcttca tcttgttgtg aatatatagg gggaaaatat cggcccggcc     660
atcctgccga tggaaaaaat ttcttgaaat gaagaggctc tttatccgaa taagccgaat     720
gctgccataa aacaagagag aactctcgtc ctctctcatc agtcctgccg gcatctccga     780
agaggccgaa ccttatctcg gaaaacttat gcacctgtga acccgaagca tcgccggaag     840
cgaaaaccgc ctacaccggc ctcttactct ggggagcctt tagttcccat ttcgggatcg     900
accatgattc gtccgcagta ttcgcagacg agatttttt ccgaagcttg acgtccagct     960
```

```
gcttctgagg aggaatcttg tgaagcaacc gccgcaagca tcacgctcta cgggcaccac   1020
ggccaagcct tgtgcgcagc ctttctgatg cgcttgaaag ccgtcagcag gcgcggttga   1080
tcttggcttc gagcttcttc gcctttttcgc gcagtttctc ttcctctgct tagtctcggc   1140
aatgatggta tccagttcgc cgcgttttttc ggccaaacct cgctatgctc ttccagcacc   1200
tctttcagag tagctatatc ggtctgcgct gttggatttc gacgttgtat tccttgatct   1260
tcttttcaga cagtggatct ccagctcctg aaattcgatc tctttggaga gattgtcgaa   1320
ctccgattgt tgcgcacctc gtcgagctgt tttttatatt tctccagcag cgcttggctg   1380
tactgatctt ttccttttcg gtggttacag cctgattgag cgcttggatc cggctgtgaa   1440
gttctccaaa cgagtctgca ttccggcgat tcgtcttcca gatcctgtac ttccagcggc   1500
aattcgccac ggagagtctg atcttatcta tttcagagag ggtattttgc agcttgctca   1560
gtgctgccat ttttcctcta cgctctgttc gttctcaacg atgatctttt ctttagcatg   1620
atgctcaatt aactaactac aaatagttta ccggattggt tgcaacgatg atttgtgggt   1680
ggcaaaggta gggaatttct gcgatattat gcgcaaaata gctcattagc cacctcttcg   1740
ctctcgtaat gaccgatcgt aaccgcagca gatgctcccc tgcatcgaag aagtcgttgt   1800
acttcgcctc cccgtcagga agaggtctgc accctcctgt gctgccctcca accgaatggg   1860
agaccgctac cgccgcatat agccatccgc ctcaacggcc gttccctcca accgaatggg   1920
acaggacctt cagaccgaat acctccttga tgtgcagcag atctcccgct cgcttatggg   1980
cgaaggcaga tcccccacta ttccgcctcg gccgagggat gatcgttggc cagcgggatc   2040
aggctgacag ccggcagccg tacggatgag ccgcgtgcaa agcctgcagc acagtaccct   2100
gcctgtagcc ggcagtacga ggctgatccg ctcctccgcc tcatggtgca attcgctatc   2160
gctcccacaa agggattggc accctcggca gctctgaaag tcccttgccg gcatggctga   2220
acgaacagca atcgtaatgc cccaaacggc ctgcccggcc tgccacaaag cctgcctcac   2280
ggcatcggca tactccgtgg ggagaaggtg accagttcta agagcttgcc ttgcagcggc   2340
tccagcggtc gctattcagc aagccgaagc gttcggccag cagcgcattc agtccctgcg   2400
ggcgttgtcc gcattggtat gagccgcata tagcaccaga ccgtgccgta ggccagctcc   2460
acgcatcgct ccacgtagga gctgccggtc aatcgcttgg cggtttgaaa agaatcggat   2520
ggtgggcaat gacgagattg catcccagcg aatggcctcc tccaataccg cttcggtaac   2580
atccacacag aggagggacc cgttgcctcc cgcttggtgt cgcccacctg cacgccacta   2640
ttgtcaagct ctcttgataa gccctcgggc agaccgcctc gatagcctct ataattcctg   2700
                                                                    2750
aatgatcatc ttcgagtgcg agccaagagg ctctgtttgg tttcttgtcc
```

(2) INFORMATION FOR SEQ ID NO:320   :

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 984 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...984

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:320

```
ccgatcgaat gcctcttcac gatggacgaa agagacgggt atgaccggtc gatgaaccta     60
aagcccggat ttttcaatgn aaagatcctg ctcaacctga cagcgaagac gaaggagagc    120
tcttcatcgg gtgcgccgga ggtatggaac catggtcgaa tttgcctacg aaaagcgcga    180
agcgacagac gactattcta tttcaaggta aaggtcagcg gtctcaaagg cggtcactcc    240
ggagggagat tcacatcggt ctcggcaatg ccaacaagat cctgactcgc tatcctatgc    300
tcttgagcac gaattggatt ggaagctctg ctctttccag ggagaaacct gcacaatgcc    360
attccgcgcg aagctcatgc cgttatcggc ctaaggctga tcagaaagaa cgtgcacgag    420
ttatcttgaa cgaactcgct gtgcagtgga ggacgaactc aagcgagtag atccgggtgt    480
gaagctcgaa tgaaatcggt aggaaagcct gcatatcgta tcgattgtga cacgaagcgc    540
gtcttgttcg cgccctgtat gcttgccctc acggcgtcta cggtatgacc atgacatcga    600
aggtttggtg gaaacgtctt caaacttggc ttccgtgaga tgaaagaaga tgataagatc    660
tacgtggaga ccagccaaag aagctcacat cgtctcttat cagcgatata gccaatacag    720
tggcatccgt attcggcttg ccgatgctaa aatcagcttc cgcgatccgt accccggatg    780
```

```
gaaaccaatc ccgattcgcc gattttgaaa gcggcatctg agtcgtatga gcgattttcg      840
gtcgtaaacc tgctataaaa gcaatccacg caggtttgga gttggtctct tcctggataa      900
atacccctat ctcgatatgg tttcattcgg cctaccctcc gagatgtgca ctctcccgta      960
gagaagatcg aaatcaagac gttc                                             984
```

(2) INFORMATION FOR SEQ ID NO:321

  (i) SEQUENCE CHARACTERISTICS:
    (A) LENGTH: 506 base pairs
    (B) TYPE: nucleic acid
    (C) STRANDEDNESS: double
    (D) TOPOLOGY: circular

  (ii) MOLECULE TYPE: DNA (genomic)

  (iii) HYPOTHETICAL: NO

  (iv) ANTI-SENSE: UNKNOWN

  (vi) ORIGINAL SOURCE:
    (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

  (ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...506

  (xi) SEQUENCE DESCRIPTION: SEQ ID NO:321

```
gtagcctctc tcattcaatt tatgagctaa atccaaaatc aaatcacaac tttatcaggc       60
atgatacgag agaaaaagac aagacgcaac accttggagg agtatagggg gtatgacaat      120
gcaagggaga aaacagagat atgtcctgaa gttaggcata acttttacat tctctacacc      180
ttgcccacac aaagcacttt cattgcttgc ccttcgacca aaagatattg caaacttttc      240
aaaactcaac tcggtatctt cccttctcaa cttctaaatg aagatccccc cctataccca      300
aagaacaatc ttacgcttag gaaagacaac tttcaaaata cgggcaacca atacacattg      360
ccataactag ttgagaaaat tatgggagta ttggatttat taataagata aaaggcaatt      420
tccacaatcg ccaaggctta gacgactccg ataggtatca actataatta gtttgncaac      480
aaagtcccta gccttttcgt taggaa                                           506
```

(2) INFORMATION FOR SEQ ID NO:322

  (i) SEQUENCE CHARACTERISTICS:
    (A) LENGTH: 909 base pairs
    (B) TYPE: nucleic acid
    (C) STRANDEDNESS: double
    (D) TOPOLOGY: circular

  (ii) MOLECULE TYPE: DNA (genomic)

  (iii) HYPOTHETICAL: NO

  (iv) ANTI-SENSE: UNKNOWN

  (vi) ORIGINAL SOURCE:
    (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

  (ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...909

  (xi) SEQUENCE DESCRIPTION: SEQ ID NO:322

```
aaacgggttg ccaagtgact gattgccggt ctatggtata ggaatagcga gttctcccgt       60
ggctttgatg aactgagaga aggggacgcc gacgaaatct tggtgtcgct gtacttcttg      120
ccggctgcca gatagatcag attcagggat tgcctgcctc ggatagtccg aattgcatcc      180
aaagatgatg aggactttct ctgaaacgga tttgttgaac gtatagatat accccatttg      240
agcaagaact gactctgaag gctgagcagc aggggcggat tgttcgccgt aatgcctgga      300
```

```
aagtttctgt ctgatgcccc aggaggttgt agttgagctt gaggggaaaa tagcatgccg   360
gtgttccttg gagggctgaa attcgtaggt ggcgaaaagc cgaaagagta catgctaaag   420
tagtgtgccc tgttcagcgc gtggcagaag cctgaaaagt cgtagtcgtg gggtagtaat   480
agtatttatc agcagaccgg gaaatacaat cgagggaaac gagaggttca cggccgtatc   540
atgttgtacg aatttatatc gatcagccga ttgctgctat tttcgggaga ttgccggtct   600
cccactcata cgatccaccg atattccaag aaagatttct cctccgccga atacattgcg   660
ccgagcaaga gcaaaattca gtccggaccg atgaagtcat tgcttttgct cgtgaacaag   720
gtctctaatg atgcacccaa ggtttgtcga gggtggttag cagtcgcaca tccaaaaggc   780
cggaatggaa tcgcgttgca aaaaattgag atcgataacg agaaggctc ccaacgagcc     840
aaggatttgc gtgtcgtctc atcgtctttc tgccgataca gatgccggag aaagaaacga   900
aagcgtttg                                                          909
```

```
aggcagctcc ggctgattct acgataatac taacncagat aataccgaac gcaatgagta     60
agaatttgag tgttattata aacggcatta tcaaggagac ccgacattcg tcctcctcct    120
cggtatgtgt cctacgttgg ccacgacacg tcggccatca acggtatgag tatgggactg    180
gccaccatgt ttgtatgatc tgctccaaca tggtagtatc cttggtcaag aatctcatcc    240
ccgattggtt cgtatcccgg cttttattgt catcattgca ggtttcgtga cgatttgcag    300
atgcttatca aggcttatat gccggatttg gacaagagtc tcgtatcttc atcccactga    360
tcgtggtgaa ctgtatcgta ctcggtcgtg ctaagccgtt gcatcgaaaa aaggtctgct    420
acactccatg ttcgacggta tggtatcgga ttgggcttta ccctcagttt gactgttctc    480
ggtattgtcc tgagcttttg ggtagcggta agcttttcga ctttgcagtt ttcaatgaac    540
ctatggagca ttgatcttcg tattggcacc cggagctttc atcgctttgg ctacctgatt    600
gccttggtga acaaaatgaa gaaaaaagca taactcatta agtaattggc atcattatgg    660
aatttttcat gttattcata gcggcgtttt cgttaataac gtcgtgctgt cgcagttcct    720
cggtatatgc ccattttagg cgtatcgaag aaggtagaca cctcaatcgg tatgggtgca    780
gccggacatt cgtattggca ctggctacct tggttacctt cctgattcag aagtcgtttt    840
ggatcgtttc ggattgggct ttatgcagac cattgcattt atttggtcat tgccgccttg    900
gtgcagatgg tggagatcat actcaagaaa gatctcctcc cctctatcga gcactgggtg    960
tattcttgcc cttgattacg cgaactgctg tgtgctcggt gtggctattt tggttatcca   1020
gaaggattaa ccctgctcca gagcttcgtc tatgcaatat ccacggctat cggtttcact   1080
tggcaatggt tactttcgca ggtattcgag agcaactcga tatgaccatc tccccaaagc   1140
tatgaaggga ataccttcgg cactcttggc tgccggatat tggctatggc tttcatgggc   1200
ttcagcggta tcgcctaacg agtaagaaca ataaatagag agagggtatg cccatcgcgg   1260
tgcataccct ctctgttttt tattgtgact tagccgtatg gaaaatcttc ccgaactatc   1320
tgcaaatctt tttcgttcag ttacgacaga tgcgatcccg ttctaaaaga tttaccgatc   1380
cgaagagaaa aagacagagg cttggaggat tacagacgag gtcgattact ggctactcg    1440
tttccggaag ccttcgttca tcacagtctt taagaaccgt ctccatcgga caaaataagc   1500
atatagtcca caccgggggat tcggcggcaa tagcaggcac acgctccgaa ccgaccacca   1560
taaaagtata gccaaggcat cagccgtcat acaatcggga gcaatgactg tggcactagc   1620
acatccgtct gcacaggata gccgctaagc ggatcgatcg tatgtgatac ttcttcccat   1680
cccgaacata gaaattccgg tagttgcccg atgtcccaag ccccctttcc cactaagctc   1740
tacgacgagt tcgaactcct gcatgccaag cccagactgt catcctgcgg tttacttaca   1800
cctatgcgcc aagcttgcct tgaggattga ggccattgaa agcaacctct ccaccgatct   1860
ctccatatag tccccgatcc catgagcagc caaggcttcg cccaccagat cgaagcatat   1920
```

```
cctttggcga tggaagaggt gttcagcgta gtgcgcggat atccttaaca accgtctcgc    1980
catccaatcg taccctccgg taaccgacaa ggccctgatg ctgtcgatca actgtgcagt    2040
cacgtcctct ttatgttcaa accgaaaccc caagcattga tcagcggaga gcaagtaata    2100
tcgtaaggcc gccggaaacg gctgcaatct cctgcgcccg acgaaatacc cggcggacat    2160
actgtcagtc ctgaccggaa gattccgatt cactccggca atgatctggt actgtcgaac    2220
ggattaaggg aatgattgaa agctctgaat acgcatccac tcgctgcgaa tgatctgcct    2280
ctcccttata tttgatatga taaaggtatg gaatatctcc ccctgcaata ccgtataggc    2340
aggtgctttc cgcaagaaaa aaaggccgca ccgagaatga tcatccccgg aacggccgct    2400
aacctgacca acgtttcata atttctcgaa gctgactacc tcttcaatgg tttgcgattg    2460
aaagcctcac gcggaggtac ggtcggatcg ccatagccgg agccaatatg gaaacaggtg    2520
tcatgtgcga agggatgtcg aagatctcga acaaagagct tgatcgaaag cacagaccca    2580
cgtacatcca agtcccaact atgtgcttcc agcatcatat aagtcatggc gatagaggta    2640
tcgatgctac caaatcgcgg gtaccga                                        2667
```

(2) INFORMATION FOR SEQ ID NO:324

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 428 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...428

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:324

```
ggggaaaacg actctgacgg aaaaattctt gctcttcgga ggcgccatta tgtggcagga     60
gcggtcaaaa gcaacaagat aaagaaaacg gctaccanga ctggatggag atagagcgtc    120
agcgtggtat atcggtggca acttccgcat gggattcaac tacaaggact ataaaatcaa    180
catcctcgat acgcccgtca ccaagatttt gcggaagata ctttccgtac gcttactgct    240
gtggaagtgt gatcatcgtn atcgactgcg ccaagggggt cgagacgcag acnccaagct    300
gatggaagtt tgtcgtatgc gcaagactcc cgttatcgtc ttctcaataa gctggaccgt    360
nagggacagg atcccttcga tctgctggac gagtggagga agagcttcag atncgngtgc    420
nggcactc                                                             428
```

(2) INFORMATION FOR SEQ ID NO:325

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 397 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...397

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:325

```
gcgaataggc ctgacaacac cgtagccata taggctatca gcacggtgaa agaagcatcc    60
tgccggcacc tttcccgatg tcggcaatag ccaccgtccc aatccgagga taatcagcgg   120
aatggagaag ccgagcagtt cgctgaaaga gcattgaacg tgacgaagat ccgaataaac   180
gggaagctga agaggtgccg aagccgatac cgaggacaat ggccaatatg atcttgggca   240
agaggcgatc cgtagtttac gcatatggtt gggggttgct tgatcaagaa gattttgtt    300
ggaaatatag cggaagttag catccagcag acgacgggca gcgcgaaact cctggcacga   360
tcttccaaca cgtctcttcg actccggtat gactctg                           397
```

(2) INFORMATION FOR SEQ ID NO:326

    (i) SEQUENCE CHARACTERISTICS:
       (A) LENGTH: 844 base pairs
       (B) TYPE: nucleic acid
       (C) STRANDEDNESS: double
       (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
       (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
       (A) NAME/KEY: misc_feature
       (B) LOCATION 1...844

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:326

```
ggtttctgta ccaaaagtag tccattctta tcgaatagag ccatcggcac gcgaaaggcg    60
aatcaagaaa caggaaaagg gtacaccccg gattcttccg cattataatc caaggtaata   120
caggatgcac gtctatacgc ccatatactt gccatcgaca ttgcggatgg aattatgtac   180
ttgtttctca taagccttca ttcttttagg atagatttaa caatatgcta taaagacata   240
aaagtgtgtg cctattcata atttacgaac ggcaattcgt caaaattccc caccttgccc   300
tgcactatca gggaaagaac gatatgaaaa gactgataac aacggagcag cctttctact   360
ggctgctaca ctctctgcct gcaacggcaa tacacaagtg aaacccaagg cgatcggact   420
gaacaggccg aaacggtaca accgatctct tctcggccga ctcggcttac accttcgtgc   480
agcgtcaggt aacttttggc cctcgcatcc ccggcacagc tccgcatcgt gcctgtggaa   540
ttggctcgtg gccacgcttc gcagctttgg tgccgcggtg caagagcaac agccgaaatc   600
aaagcgcatg atggcaccat gctgcccatg cgcaatacat agcctcatac cgccccgaag   660
ccaccgggcg tatgctactg atggctactg ggatacgcgg ccggtctgcg atcaggatgc   720
caaccccgct atgcaacaga gaccttcgac ggtgcggacg atggcggcag cggaattagg   780
cgttttattg gagatagcgc gctatctggg acaacagaaa gatttgggca tggcatcgat   840
attg                                                               844
```

(2) INFORMATION FOR SEQ ID NO:327

    (i) SEQUENCE CHARACTERISTICS:
       (A) LENGTH: 723 base pairs
       (B) TYPE: nucleic acid
       (C) STRANDEDNESS: double
       (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
       (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...723

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:327

```
gccgagaaag agcaaatgat tttttcgagc gtaaaacgga cgaattgcct tcgtgttttc      60
cggaaaaatg gaaccataaa tttttcgttt tggtttgaaa cttttttctt ccggcgcggg     120
aagtgaaaaa ttctcgcgcc acgtttttcg ttccgtctga aacaattttt tggaacgtaa     180
aaactcgaag agggcggggc ggatcaaaag aaaataagtc cgaatcggag gaaaaaagca     240
gcaagcaatg caggttcaaa ggcaagttgt gtcgtttttc aggcttctcc atttctgtat     300
aacttccgtc taatcccgat cttggcagca gtatcggtgg agtgggactt tcggacaatt     360
atcaacggtg ctcaattcat tatctttgca gcatttagat acgaaaaaat aatctgaaca     420
ataatggata gacaattcaa ggaactctta ttactacggc cctcccgtat gccaacgggc     480
ctgtacatat ggacacttgg ccggtgtcta cgttccggcc gatatatatg cacgctatcg     540
cgattgcgtg gcagagactg cctgctgatc ggcggttcgg acgaacacgt gtacccatcg     600
ccctgaaagc caaagccgag ggatgcactc cgcaggagtg gtagaccgat accacgaact     660
gatcaagccg ttcgttcgaa gggctggtat ctcttcgaca tatacttaac gtaccacaag     720
cga                                                                   723
```

(2) INFORMATION FOR SEQ ID NO:328

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 3294 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...3294

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:328

```
ggcacatcta tctcttccag caaatcctca gctacgggta aaaggagttt tttccttcgg      60
gcgtagttat agacaaaagg acattgagcg tactctcgcc acatcatcga ttgtccctac     120
gaaacaacct tctcggtcga ataccgtaag ccgatgaaat gttcccaggt gaattcgata     180
gaatcagtat cgaagttcgt cgttccataa agagagacac accggtgtac tgctccatct     240
cctcctgctt tcaataccgg caaagcggaa ncaaagtaat atcatcggtt ttctacggta     300
gccaataaga cggaacggaa ccggcaatgc atccagctcg aaaagagaaa caaccgctct     360
tcttcctcaa agagcgtact caaatcggct gtagacgagc gttgcactct ccctgaacgc     420
catgcggctt acccagcaca cgatatgctc caatgaatcc aaatcgatca taaagcatca     480
aaggcgagag tacgtgcgcc gatagcgttg aggcgagtat ctatggattg gtaacccctt     540
cgatctgttc tacgttgtgg atgatacttg ttccttctgc actcatagtg caataaggag     600
ggctataccg gcacgaatat cgggtgaaac catagttcag ctcgcaaggg aacacgtttg     660
tccaaaccga tgatcgtagc acgatggggt cgcaaaggat aatctgtgct cccatatcga     720
ttagcttatc gacaagaaga gacggctttc aaacatcttc tggtgaatca gtacactgcc     780
tttccctgag ttgccaccac gagaaagacg ctgagcaagt ccggagtaag accggccaag     840
gagcatctgc aatagtcatg atggatccgt ccataaacgt cttatctcat aatgttcctg     900
cttaggaata aacagatcgt cgccttgctg cccacagcaa ttcccaaacg gcggaaagat     960
gcaagggatg atacccagat aggcacgctg acatccttga tcaaaagctc ggaagcggtc    1020
atcgcagcct tccgatgaag ctacccactt cgatcatatc gggcaacatc ttatgctcca    1080
gccatgtaag ctctgtactc cttcgatacg aagcagatta gagccgaacc ctctatatgc    1140
gcccccatac taagcagcat cttgcaaagt tgctgcgata tggctcacag gcagcattat    1200
aaatagtggt aataccatca gcaagacagc tgccattagg atattggcag tacccgtcac    1260
agaagcttcg tccacagcat ataagtgccg gaaagccggc ttgcagtcaa ttcataggct    1320
tgctatcgga atggtagtcg cacgtggcac ntaatgcctg aatacctaca agtgagtatc    1380
```

```
taacctgtgg cggccgatct tatctccccc tggtttcggg aaatggcgta accgaagcga    1440
ctgatcagtg gcccaacaag caagaccgaa cgcgcaaggc gcgactcttt tcgagaaact    1500
gctcgctttt gatatagtca gattcacatt atcagcttgg aaaacacaag tatcgcgggt    1560
gggtctttta ccttaacccc catgtttcga agcaggtcga tcaggttgtt cacatccata    1620
tatcggggat gttacgcacc acaacctcct gatcggtcaa tagcgtgcag agatgatctg    1680
caaagcttcg tttttttgcac cctggacgag aatctaccct tgagactgtt gcccccttct    1740
attacgtaag atgccataga gatatgtgtt ttatatgtct gtatgattat ttccgccgga    1800
ataccttgtt ccgttggtgt tgttattgtc cttccgatcc gaagcattcg gtatcgtcag    1860
atacaactct cctccgtcag ctctatgcgc ccttcggaca gttcgtacaa accttgaata    1920
tcttgtagtc atccaccgta tctttgttcc atgtcagata gaacgcttca tctggttggc    1980
gatgagcagc tccagcgcat aacgctcttt ccctgctcca tggcacaagc cttgaggatc    2040
atttcctgta tgagatggcg tagtgccgat atacgatgtc gttggccgag tagcttacag    2100
ctttaggttc cgttcgagca gctccggact gatgatctcc atcggataat cgatatcaac    2160
ttgaatccgg acataatagc cagatgatcc caaagaatat gcttgtctca ctgttttccc    2220
gccgttcggg aaacatgttt cccatgattg taatatcgtt tgtgcacagc gattccgttc    2280
gtcacgatca ccgattgtca tgcataattt accatgtttt ggatattcct gccatattcc    2340
ggaatagcca aagttccatt ttactattat aattcatcct ctgatgtttg taatttctaa    2400
cctctttcag tcggcctgcc attgctgctg attctgtttc atagccgggc tgttcagcaa    2460
agcaaacata ttgttcttat aaccttcgac ccccggttgt cgaaaggatt cacacccagc    2520
atatagccac tgacgcctac cgctttctaa agaaatagaa caactgccct atataataag    2580
catccaattg cggcaaatga tgcgtatatt aggtactccc ccatctacat gagccagccg    2640
ggtaccaatt cagccatctt atttacttcg tctacacgct ttccggccag aaagtaagcc    2700
catccaaatc cgccgagtcg gaaggaatcg tcaagcatgt atctgatttt ctacggaaat    2760
cactgtctcg aatatcgtac gttcgccctc ctgatccatt gtcccatgga atggaggtcg    2820
gtagtcagat ccacagttgc cggaagatcc ccttctcctc tttgccctcg ctctcaccga    2880
aaagctgctt caccactctc cgatatagtg cattttggga tggaaattgg ccagtatctc    2940
atcttctttc cttcggcata caaagcattg cgagctgccg cgtatcgtaa gccggattgt    3000
ccgaaaaagg aatgtctgaa gccgtcatgg cttgcatacg gctgcacctc gtaccaactg    3060
acgaatatcg aagccggcta ctgccacggg agcaacccca caggagtgag gacggaaaaa    3120
cgtcctccca cattgtcggt atgacgaaag aacgatagcc ctcttcatca gccatacgtc    3180
ttaaacacct ttggccgaat cggtaacggc cacaatcctc tcccgagcat cttccgtccg    3240
acctgcgatt ccagcaatcc tttcaacaga cgaaaggcaa tagcggttcg gtag          3294
```

:

(2) INFORMATION FOR SEQ ID NO:329

    (i) SEQUENCE CHARACTERISTICS:
       (A) LENGTH: 902 base pairs
       (B) TYPE: nucleic acid
       (C) STRANDEDNESS: double
       (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
       (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
       (A) NAME/KEY: misc_feature
       (B) LOCATION 1...902

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:329

```
tggcgcttac aaaacgaaca ggatccggcc aaacgtcagc agatcatcgt aaaattctca      60
agctgtatga tgaccgtgtc aaatacttcg gagaagaccc aagtatggaa cggactatat     120
catggccagc aaaatatcgg actacatcag tatatgggcg ataaaacgga ttatgacaag     180
gtttatgaat ggatcagccg accatcgatc agcatggaga gaatgctacg cctcgagctc     240
tattcattat gcttactcct ctctgaacaa agctatcaga aatgaggcat ggcagaaacc     300
tatattaagg attatacgtt tgcatcccag gccatggaga agcgttggaa gtggccgatg     360
agaaaggcaa agagtttatc caaccgctga aactcagatc gacgaactct cgcccagag     420
tggtcttgca gactgcaata cttggtgaaa atgtatggcg ataagctgga ggaaaacaag     480
acggatacga tttcctgaag aatatgctcg gcatgttcca cgcttccgac tgcgagacaa     540
tccgctttat ttccaagcca ataaatacct ctttgccgta cagccctcgc tatagctgct     600
atgggccttg ccaaagaggc gatggaagga aatcgatcaa tgaagccagc gactatctcc     660
```

```
aaaaggctat cgaactaagc aagagtccaa agaccgtgca gcctgcaact atacgttggg    720
tctgttggct atgaacaggg tagttactct acggcacgct cttactgcaa taaagcactg    780
gccgagatcc tgcgatgggc gatgctctta tcctgattgc ccaaatgtat gcacaacggc    840
caatactgtc ttcccggtga tgctatcagg cacgctgngt attttcctgc cgtggacaaa    900
ct                                                                    902
```

(2) INFORMATION FOR SEQ ID NO:330

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 492 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...492

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:330

```
cactattgtc cgggttgtag ccacggagtt gtgcacaaac tcatcgcaga gtaatcgaag    60
aaatgggctt gacggaagaa actatcggca tcgccccta ggatgctcag tattcgccta     120
tcgctacatc gatatcgact ggcaagagct gcccacggcc gtgcaccggc tctggctaca    180
gcagtaaagc gtctgatccc tctaagctgg tatttacata tcagggcgac ggagacttgg    240
ctgcttcgga acagccgaga ccatccacgc agccaaccga ggagaaaaca tngcattata    300
ttcatcaaca acggtatcta cggtatgacc ggaggtcaga tggtccgact acccttgaag    360
gtatgggtac cggntacttg ccctcaggga agaacgtaga gctgaaccgg tattccgctg    420
aagattgccg atatgcttgc tttgctcgac ggtacttggc tcgtaacgcg ccaagaaccg    480
tgcacaatgc gc                                                        492
```

(2) INFORMATION FOR SEQ ID NO:331

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 4074 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...4074

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:331

```
gatttctttg aaagcatatg atgactttct accatcggca cgcaccaaca cagctctccg    60
gaaggcaata catcggcaat tatggcatcg aaacgccctc cttattttgg aagggatggt    120
accctaccct cctgtaaaga cactgcaata acgagtgtga agctggtcgg cagtatgctc    180
ttctatgtgt ctgtaggtga acgcatctcc tgcataaaag agcggaatat ctctatacga    240
```

```
tctacgaatg ccccagaatg atccggaccg atgtaggatt ggggagatag ctcgatagtc    300
gctttcgttg atattgagac cgacacccag aatgctgtag tcgggttgct gcccgtcagg    360
ctgtgctcga tcagtatgcc tgctattttc cttctccata gtatatatcg ttcggccatt    420
tgatgctgag catctcggca gaggaagaag gtcgtagagt gtatggagca cggagagtgc    480
acacaatcgg agagatcgaa ttgctgctgt gcaggaagca tggtcggcct cagcagaacg    540
aaaaggtcag gttcaagccc ggagacgcga accagctatt gccctgcttc ctcgtcccgc    600
agtctgattg tctgtcatga ccacggtcca cgcaggtggt cgggatcctg catcaaaaga    660
tcggacagat aggagttggt gctggcgttt cgggcagatg gatcagatac ccttcagacc    720
aactgttctt cttggctcca tcgaaaggcg gttgtgtacg gatgtattta gggagtttgg    780
atacacgaga gcgtacgaat gtcggatgag ccgtgcaatc agatcggcag gggatccgag    840
tccaaagcta cgctgttcca atgtcgtttg ttcatatgaa aaccccgtg atacccctcgt    900
agtgcatcct taaatgttcg gaccgatcgg gtcgcatttg agtgcgatga cttttttttc    960
ggaatcaagg ggtatcagag aaacattttg ccggctactt tcataaccaa cgtaacatca   1020
tcgaacggga actctcctcc acctgtggca gtgacaagca tagctctcga gcttgctcat   1080
gtccatatat tattttattt ttgctacgtt atgaatttcg ctccactttg cttggggcac   1140
ggtctaacaa aaataatgga aaaactcatt tttgcccaaa caatccacat aagctcaacg   1200
agattcgtca tattcttgag ggaaagtgga gattgtcggg ctggacgaaa taggttgtcg   1260
ggaggatatt cccgaacggc cgacacacta cagggaaatg ctttgctcaa agcagaattt   1320
gttacaaacg atatggttta ccttgctttg ctgacgacac aggcttggaa gtgaagctct   1380
tgacagagca cccggcgtcc actctgcacg gtacgcagga gaccgaccaa tgccgatgcc   1440
aatgtacgga aactactcga agcattgagc gtgtaccaca tcccagaaaa gcatgcttcc   1500
gtaccgtgat cgccctgatg atgatcatgg aaaacacttc ttcgaaggga agatcgaagg   1560
taccatagat ctgaatgcag aggatcgggc ggcttcggct atgaccccgt tttcatccgg   1620
agggacacac gctcagcttt gcagaaatgg gagaagaaac caaaaacaaa tcagtcatcg   1680
tgctttggcg gtggcacagc tccgcgattt tttatatgtg caaaataaga ttcagcctct   1740
tgcaggctct tgtcgtctgc ttatgttcac ctctttttct ctccaagctc aagaggaagg   1800
tatttggaat acctcttggc tatccacaag acggaaaaag ccgtagaaac gcccaagaaa   1860
gttttgccgt agccaacgga gtactttact cggtgggcaa agaagctccc ctgaggcaaa   1920
gatcttcgac cgtatcagcg gactcagcga tacatcggta gcagcatagc ctactccgag   1980
caactaaaat ccttggtcat atactatgct caggcaatat cgacatcttg gacgaagcag   2040
gccgtgtgac caacgtactg cattgaaaga caatatcgat ctgatagaca aaacgctcaa   2100
tcgcctttga tcgtaggcaa cagggcttat ttggcaggag gattcggcct ctccgtctgg   2160
atgtcgccga agctcgcata ccggctacct acgccaaggg aactaggtga ccgatgtggc   2220
taagttggac aatgatcgct tgctgatgct gaaaaagggc agctcttcat cggaaaagag   2280
accgataacc tgcaagatcc ggcgcatgga cagccttgtc tttgaatttg ccgatgggct   2340
cggtcaccgg tcgggcattg tcggggaaga catctgtttc ctgctcgccg atggccgtgt   2400
aatgtcgctg caaaccaatc gtttgagccg gagctattgc tctcttcctc gccgattcac   2460
gactgtatgt gacggatcgt ggtctgttca tctgtgccgg aatcgaattt atttcataga   2520
aaaaggtcgc aaaacgacac aatttcctta gccgacgtcc ttggtgtcgg tgccatgaac   2580
gaaagcaata cggcataata gcattgggag aagaaggttt ggcttcactt ctctcgcag   2640
agggaatacg gccgaagcca tgcctgtagc attcgacgga ccgggggaca atgattctac   2700
gagatgcggt ttagtcacgg acgtctgtat gcagccagcg gacttgggga acaaacctga   2760
tgggacatgc cggtatggtg aagctatacg acgcaaccga tggactaact tcgacaagaa   2820
gaccgtacag gaacagttgg gcgcggattc agtttcaatg atgctatcga tatagctgtt   2880
tccaacggag acccgatcac tttttttgtcg gtacatgggg aaacggtctg ttcgaattca   2940
ggatggcaaa gcgatagctc gctattcggg aaacgaaact gctatcgcaa atgtaatccc   3000
ggagatgccc gtgtgaaagc gattgccttt gacaataagg caacctctgg gggacgctcg   3060
gtgccgtagg caagaacatc ttcatgtcga tccgcagagt agcacatggc attctttcag   3120
ctatccggat gtagccatct ggcctccttc ggcaatatga ttatcctacc caacggagac   3180
aaatggtaaa tatccttcac cgtagtggcg gatccacgcg caaaggtgtc ttgacttcaa   3240
cgatcggggt acaccggaaa cgacttcgga cgacagccat cttacgtcga gcagtttgtc   3300
aatcgcctcg ggcagccat aggacataag acatctatgc aatggccgtc gatcataacg   3360
gctctgtctg gatgggatcg gtataggcat tttcggcgtc tacaatgcag ccggagtatt   3420
gtcctcgact ctaccccctat cgctgttcgg ccggtcggag gagaagaacc caatttgtat   3480
atgtgctgga caaggtgacg gtgacagaca tcgtcgtgga caaactcatc acaaatgggt   3540
tgccacccaa gggacaggac tctatctcct ttcggaaatt gcagtaagat cctcgcgcaa   3600
tttaccgtag aaaacagccc tttgcttcta acaacatact atccctggcc ttaaatgacg   3660
ataacggact gctgtcatcg gtacggcgga cggactgatg acgttccaaa cgggtacggg   3720
gagtgatcag cttccgaact ggacggcgtc tatgtatacc ccaatccgct aagccggaat   3780
atcccgatgg cgtcaccatt gccggactgc aagccggctg tatgtcaaaa tcaccgatac   3840
caccggcaga ctgctatacc agactgagag ctaaccaccg aagtcaaatg gaatgctcga   3900
ggtgccgatg gcaatagggt gcttcgggcg tatatgccgt tgcagtgtac gatccggtat   3960
cgaaaaagtc aaactaattc gcttcgcagt gattcgctga cacacggcct ttttctctgt   4020
aaacaacatt ttaatccaaa ctaataggta atgaacaaaa agattttggt gcat         4074
```

(2) INFORMATION FOR SEQ ID NO:332

```
    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 917 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

   (ii) MOLECULE TYPE: DNA (genomic)

  (iii) HYPOTHETICAL: NO

   (iv) ANTI-SENSE: UNKNOWN

   (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

   (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...917

   (xi) SEQUENCE DESCRIPTION: SEQ ID NO:332
```

```
ggctgcgatg tctataccac tctcgacatg gatatgcaga gcatagtcga gtggagttgc    60
gcagcaagct cgaagaggtg cagggagaaa gtggaacccc atcctcatgg aggtagctac   120
agggcaggta aaggctatca ccaatctcag cgcacgccct ccggcggata tatcgaatcc   180
aagaactacg cagtagcgat atgtcagaac ccggttctac gttcaagacc gtgtcgatga   240
tggtacactc gatgccggca ttgtgcatcc ggaggacatc atcgaaacgg gcaaggtctc   300
ttctccgtag gcaagcgtac tgtaagagac cataatgcac acaaggaggg tatggccccc   360
ttacggcagc tcagacgatt tggtactcaa gcacgtaggc gtagccaaaa tcattctcaa   420
aggctttgcc cacgatcccg aaaatacgtg gaggcggtca ggcgaaccgg tatcacggac   480
aagttccgtc ggaaataccc ggagaagctc cggccgtagt gcgcaagcgt gccgacaatc   540
tgaccgctgg tatggcacga cccttgcatg gatgtcattc ggatacgaac ccaaatcccg   600
ccgatccata cattggcttt ctacaatgcc gttgccacgg tggtagaatg atgcgtccct   660
acttcgtaac gaaagtgatg gatagaggga ggtcgtacag gagcaccggc cggtagtatt   720
acgcgattcc atctgaagca ctctacgctt atcgccatac aggatatgct ctcgaacgta   780
gtggcaaagg gaccggctcg ccggtcaaaa gctctacggt aaacatcagc ggcttgaccg   840
gtacagcgca gatctcacag ggcaaaagcg gttatcgtgc agtggcacca tgcacttggt   900
attctttctg tggttat                                                   917
```

(2) INFORMATION FOR SEQ ID NO:333

```
    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 680 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

   (ii) MOLECULE TYPE: DNA (genomic)

  (iii) HYPOTHETICAL: NO

   (iv) ANTI-SENSE: UNKNOWN

   (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

   (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...680

   (xi) SEQUENCE DESCRIPTION: SEQ ID NO:333
```

```
cggactggca cccgaacgac aaggtgtctt tcttcttcgg acgtcagtag cgcgtttcgg    60
agggatagaa tacgacatga accccgtaga gatctaccgt acagcgacct tgtggattac   120
atgacctgct atacttcggg cgtgaactcg catggaactt ccaccccgaa cagcagctgc   180
agctacaggt actcaagctt acaacaaccg cttcgccgac cgctaccacg tgacacccga   240
tgtcgtaccg ccacgagcta cccgctcctc tactcggcac agtggaacgg tacctcctcg   300
gaggagcact gcatatgcgt tacgccgtgt cgatggctca tcagcccaag agcgtaatat   360
```

```
gtggtacttc actgcgggca acctgttcaa tcgggcaaac ggatcaacgg atacctcgac    420
ctcacctact cgatcgaggg atggacgaca aaggcattat gactgctcgc tacggcaagg    480
gcaagaccct acggacgtca agtactatgc tctggtatcg aagtggaact tccgcatttc    540
gatcaggtca atctcttcct caaaggcatg tacgagaacg gctatgcgct gcccaatacg    600
gcgagagcag ccacacgcgc caactcctac ggctataggg aagggtggaa tattaccct    660
acggagacca actttccgtc                                                680
```

(2) INFORMATION FOR SEQ ID NO:334

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 855 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...855

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:334

```
ctgggttata acggtgtttt tttggctttc actcgccaca atggtaatcc cttgtcgttc    60
ttggccagct ctttgatcaa ttccatcggg ataccgaagg gtagcgtacc aaaacggctg    120
cagagcgttc gtactcagcg atagcaccac aggacctgca gggggattcg tttcctggaa    180
tgctcgttgc atctctctgt tgcaaattga ccgtttgttc ggtctgcttg catttgcgtt    240
tgggcattgc gggcagttgg aagagtccca atgccagaat caaggcttta gccttaaaag    300
cttttttcatt gtttgatatg ttttatgatg ttatgaatat gttctgaaca tatgataaga    360
tctcggggaa ataataaaga gggacatggg ccatcttttt gcgaaatatc catggaggga    420
tttaccttcg gttttttcacc tcaacccgat aaccgccgt aaaattagaa gaaatcatca    480
atatgaaata aataaacctg ttttcttgct ttttgagccc tttgcaaaaa gagaaggtct    540
caagaagtat ctttttcggta tcgttttttgc tcacctatag agtgtatcca caagtcatgg    600
aggaggcttt agaggtattc atatctataa tgacactaaa aatcagtcaa ttgacaatga    660
aatctcccgg aaaatgccgt gcgacatctt atctatcggg ttcacagctc gcacggaacc    720
tccacttccc gatccgccat ccgacacaga gcagatagca tcttccatca atagaccata    780
gtatctctca taggagacca taatatcctc tcataggaga ccatagtatc ctccatgtga    840
gaccatagta tcctc                                                     855
```

(2) INFORMATION FOR SEQ ID NO:335

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 904 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...904

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:335

```
gtcgttgatc agtcccacta cgcgacaacc tttaggcgta tgtttacgga gaacttactg      60
cttggctgga agattatagt cttggagaaa tttgggagaa aatatcattg gtggacaacc     120
ttgggctaag tagtgagatg gggaatagaa aaaacggctt gtttttattg tcgagggaga     180
tacagaggtt gccttttcca tgaacgtgtg atcccatacc taatgagcaa aggctaccgc     240
aatgcatgaa tgcccagaag atcaccacca ataaatcgct tcataaaaag ggtgtatagc     300
ccgcttcgaa tacttggaaa atgaagttcg aagcgtagca gccaaggaga tatcttgatt     360
actactttgt tagacttctt caggctacca acaattttcc taactatact gcggatagcc     420
ataagatttc ggatatagag caggggttag acaaggtatt gatggggtta atgtttcgct     480
tttctatcca atattcagcg ccacgaacta gaggcactca tgtacacgag tatggatggt     540
ttgagatcgt ttgtgacgaa aaaagagagt tagatcagct gagagcaatg tagagggtta     600
cgataatccc gaagatatca attctggggc tgaaacccgc catctaagcg ccttatcaag     660
attttcccaa aatatgagaa ggttcttatg gagaactgat atttgaggct ttggagattg     720
atgctatacg agctcatgcc cccgtttcaa cgattggata caaatccttg aggacggatt     780
aaagaaggat acttttaagc cagatttttt attatacttt tttaagggac tttagctctt     840
gtactctttt cgataaagaa tatcgctcaa tctatgcttg cacgcccgac aatgcgtaga     900
cttt                                                                   904
```

(2) INFORMATION FOR SEQ ID NO:336

    (i) SEQUENCE CHARACTERISTICS:
       (A) LENGTH: 1071 base pairs
       (B) TYPE: nucleic acid
       (C) STRANDEDNESS: double
       (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
       (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
       (A) NAME/KEY: misc_feature
       (B) LOCATION 1...1071

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:336

```
gcgtcatgaa tgctgcgaaa gctttagccg agatcggtct ggaatcgggg aacgaatcgg      60
tatctattcc cccaatatgg tacactgtct gtataccggt tgggggcctt cgccatgcgg     120
ggtgtagtag tgcctttgta tgccacagct caccggaaca gttacggttc atcgtggagg     180
attcatccat ggagacttgt ttgtcggaga gcagttccaa tacaacaatg cttatcgggt     240
acagaagaat atggtacgct aaagcgcata gtcgtattcg atgagcgcgt ggtgtcaatc     300
cggaggataa gacttcgaaa tacttttccg aatttgttcg tttggtgatt ccatgccgaa     360
cgagacgaag gtcaaagtct cttctcgcga agcattcctt ccgatccggc actgatcatc     420
tatacatcgg gcacttccgg tggagcaagg gcgtcctcct cctgcacagc aatctgatgt     480
atcagatgaa gtccatagcg agcatatccc cgtctatggg ccgggcgagc tgtcgatagt     540
ttcctgccga tgagtcatat tttcgaaaag gcatggacac tcttttgctg acgacgggaa     600
cgaggattgc catcttgaga gatccgaaga aagtattgag gcactacctc agatacgccc     660
atcgctcatg tgcaacgtgc cacgctttgg gagaaagtgt atcaggcgt gaatgagaag     720
atggcctcct ctcccgcatc ctgaaaggtg tctacaggcg tgctatggcc gtaggccaac     780
gctacgtctc gactattgga atgaggggaa gcgtgcgcca ctgcttctga gtagcaatat     840
gcctttttaca actgcactat ttttaccctg ctcaagcgcg tatgggacta cagcgagggc     900
gttatttccc cacggncgga gcaccgctat cgatgagatc aacatcttcc ttcagtccgt     960
aaacattccc atcattgtcg atatggtctg tccgaaacga ctgccacggt atctttctat    1020
ccgcagcgag attcaagatc ggctncatgg gcaaagtgat gccgggctgg a             1071
```

(2) INFORMATION FOR SEQ ID NO:337

    (i) SEQUENCE CHARACTERISTICS:
       (A) LENGTH: 532 base pairs

          (B) TYPE: nucleic acid
          (C) STRANDEDNESS: double
          (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
          (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
          (A) NAME/KEY: misc_feature
          (B) LOCATION 1...532

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:337

```
accaagacat ggcgcagctc tgtcggtgga tgggatatct atatggcacg aaaggctatg    60
ccgtctttac ggtggatagt cgcggatctg ccaatagagg gctgctttcg agcaggttat   120
tcatcgtcgt ttggggcaga ccgagatgcc gatcagatgt gcggtgtgga tttcctcaag   180
agccaatcat gggtggtgcc gatagaatag gagtacatgg ctggagctat ggtggcttta   240
tgactcgaat ctgatgctta cgcacggcga tgtcttcaaa gtcggagtag ccggggggcct   300
gtcatagact ggaatcgata tgagattatg tacggtgagc gtttttcgat gcgccacagg   360
aaaatcccga aggatacgat gctgccaacc tgtcaaacga gccggtgatc tgaaaggacg   420
acttatgctg attcatggag catcgatccg gtcgtggtat ggcagcattc actccttttc   480
cttgatgctt cgtgaaggca cgcacctatc ctgactctta cgtctatccg ag           532
```

   (2) INFORMATION FOR SEQ ID NO:338

        (i) SEQUENCE CHARACTERISTICS:
          (A) LENGTH: 902 base pairs
          (B) TYPE: nucleic acid
          (C) STRANDEDNESS: double
          (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
          (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
          (A) NAME/KEY: misc_feature
          (B) LOCATION 1...902

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:338

```
ggaaaactat catcaagact atttggatca taaccctcgc ggttattgta tatcgatcct    60
tctttattcg aattggcgag gaaagccaat ccggccagtt ctacaagaag gccgatgatg   120
cagagcttcg tgcccggctt accccggca gtatgccgtc acacgcaaca atgccaccga    180
accggctttt gacaacagta ttggaatgaa tttcgagaag gtatttatgt cgatgttact   240
acagggaacc gctatttctt tctactgata agttcgactc cggctgtgga tggcgagttt   300
cagcaagccg atagggaaag agctgatttc cgagcgtatc gatgttcttt cggaatgact   360
cgtacagaag tgcgtagtac gaccggcgat gccatttggg acacttgttc aatgacgggc   420
cactggaaga aaggcggact cgttattgca tcaatagtgc ctcccttcgg tttattccca   480
aagaggatat aagaaagaag gctatggcag tcttcttcct cttttgaaca aacgatgaga   540
tgctcttgta gcatataatg attcccaatc gtctcagata agactaactc caatggcata   600
tctcggaacc aaagccaagt ggctgttact actctcccca tcgtgcttct tgcaatagtc   660
ggagtctgga tttttcaata ttccggtatg gggagcgatt cgaaattgtc gacgaattgg   720
gtggcaatat ctttcgtccg ccatactgtc ggtggccacg accgatgctg aagtaatcaa   780
accgtcgaag gcctgtacgt gggcaatccg aagtccgtta toagtattcg cctaaaacgc   840
gaagggccaa tagccgtgtg cgtgtggaag tagccgaaac gctttttct cccaggggga    900
```

(2) INFORMATION FOR SEQ ID NO:339

        (i) SEQUENCE CHARACTERISTICS:
              (A) LENGTH: 424 base pairs
              (B) TYPE: nucleic acid
              (C) STRANDEDNESS: double
              (D) TOPOLOGY: circular

       (ii) MOLECULE TYPE: DNA (genomic)

      (iii) HYPOTHETICAL: NO

       (iv) ANTI-SENSE: UNKNOWN

       (vi) ORIGINAL SOURCE:
              (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

       (ix) FEATURE:
              (A) NAME/KEY: misc_feature
              (B) LOCATION 1...424

       (xi) SEQUENCE DESCRIPTION: SEQ ID NO:339

agtacccgga gcgggcaaga gttcttcgat cgatgctttc ggtatgcatt catcaagcan   60
gggcggaagc ttgccgtgct ggccatagac cccagcagga gagatccaaa gggagtattc   120
tgggcgataa gacccgtatg gagcagcctc tcgagagaag aatgccttta ttcgtcccag   180
tcctgctgcc ggttcgtggg tggcgtggca cgcaagacgc gtgagaccat cgtgctgtgt   240
gaagcgccgg attcgacacg atctttgtag agacggtagg angtgggaca gagcaaactg   300
ctgttcattc gatggtggac ttcttcctgc tgatccaact ggcggtacgg gggatgaact   360
tcagggtatc aagcgcggga ttatggagat tgcccgatgg gtattcatcg tcaataaaag   420
cgga   424

(2) INFORMATION FOR SEQ ID NO:340

        (i) SEQUENCE CHARACTERISTICS:
              (A) LENGTH: 3153 base pairs
              (B) TYPE: nucleic acid
              (C) STRANDEDNESS: double
              (D) TOPOLOGY: circular

       (ii) MOLECULE TYPE: DNA (genomic)

      (iii) HYPOTHETICAL: NO

       (iv) ANTI-SENSE: UNKNOWN

       (vi) ORIGINAL SOURCE:
              (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

       (ix) FEATURE:
              (A) NAME/KEY: misc_feature
              (B) LOCATION 1...3153

       (xi) SEQUENCE DESCRIPTION: SEQ ID NO:340

cacataggag ttattcgtac atttgtccga cgagggatga gccgaaaaaa atgaatccaa   60
caacagtgac tcagcaatta caaaaaacat atcaggcttc ggggatggac tgctgagcga   120
ggcgttcggc ctcgtccgtg catcggtccc tcgcagcaat cgcatttcct cacacgcatc   180
gacgatctgg agaacgctat cggcagctct tgtcatactt cgcccaggt gtgaaagacg   240
aaaaacaggc cgagatgctc ctctacctca agcgcaaact cataggtctg gcagtgaagt   300
gcatcgcgaa tccgtggtgg cacagggcac ggggcttttc tacatcgcct tcgttaccgc   360
cgcagcatcg gtttcgaaag ccttgtcacc ttctggagca ggctgagaca agcactgtcc   420
gcaagcagtt cgacgaattg gacggctcat attcgatagc ttgtggacgg ccgatgctct   480
gacggacgaa aggctgctgc cctctcgcat gccggcgaat acattcgcct cgtggcggct   540

```
cggccttgac aatggctctg caacaacagt ggcactcgaa aaagctctct tcctgctcga      600
agagctggct cgccccgaca ttacagccga ctatcgcccc gcctgctggt cggagtcgtt      660
ctcacccttc gttcctatcc ccaccaaccc gactctatta taatgagatc gcattgcgac      720
tggaagccgt caatgacata tccctttgga accgaccctt gagatgcttt cgatccgttt      780
cctcttgcct gcgaaacaga gtccatcacc aagcatttgc aaaccgagag ctttaagcga      840
tatacagaag atagcccccg acctgcgcaa attcggtatg gggataccga gtccatacag      900
gagacaggca atccggagtg gatggaggag cggagaagag cggtctggga gacaaaatca      960
gggagttctc ggagttgcag tcgaaggagc cgatgtaatg cactcttcgt tcatgaactt     1020
gaagggaaga gctttttccg cgagatgcac aactggtttc tgcctttcga tgccgcccca     1080
gccggatagc tccactgctc gaagagaatg ctgtgctcaa gcagctttgg aggcgatagg     1140
cccacagctt tgcaactcgg accgctactc tttcatgttt cgatggaaag cctccctgct     1200
gcacttcgag gttcggccat gggagcgtag gcggtgaact ggatgcactc aaagagcaga     1260
taaagcagga tgtacggtcg gcgaaaccgg caaattggac acggccatca agagctatct     1320
gcagatctgt acagattcta taaggtatgc gaacggaaga acgaatttga cgtattttcc     1380
tctcgcccat cccaccggat ctgcctgtgc tcgatcgcta ttctacaagc gtgatacgct     1440
gctgcatacg gccgaatttc tcttccgccg aagcattacg atcgggcagc gaagcttgct     1500
ggccgatttg gctgaaggga agaaagtgcc acggatacca ctctgcacca aaagctgggt     1560
ttctccctca gcagcagggc ctttttcgccc aagctttggc tgcatattcg cgtgccgact     1620
gatcgatacg gagaacgaat ggctgctcaa gcgtatggct cactgtaccg ccagctgtgc     1680
cgtccggccg aagcggccga aatatatgaa cgactttcga gcgcaatccg cacgaagcga     1740
ctctactcct gcagcgagga aatggctcgt cgaggacagc cgatacgatg aagctctaca     1800
atgcttcttc cgaatgagtt cagtgtggac gatgcttcca aggctcgtcg tcccatcgct     1860
tgtgcctctt cctcaccggc cagtacgaac gtgccggcga ttactatcgc acatactgga     1920
atccgacgat ctctcgactt tcaccgatcg gctcaatgcc ggcatacgtc tttggctatg     1980
gggcagatcc ctgttgcgat cgaccattac ttgcgggatt gaagctcact ccgacgggaa     2040
agatgaattt ctcgcagcta tacggcagac ataccggttc ttctcaaagc cggtatcgag     2100
gatgccgcat caggctcatt ccggaagtat tgaggctaca cccgactaag ggaattctaa     2160
tgtttcatct cacaaacctc catcaatgag taaaaaattt gttttgcaat cagtattatg     2220
gcaatgctca cagcatgtaa cggcagccgt aaagagatgc caacctctcc gacaatcctc     2280
tgctgcaatc gagtgctctc ttctggaagc acccgaattc gacaaaatca aaaccgaaca     2340
cttcctgcct gcttcgaagc cggcatggag cagcagttgg ccgagatcga ttcgatcgtg     2400
acaactccga agctcccact ttcgagaata cgctcgtagc catggaacgt cgggacagac     2460
actcaaacgt gtttccaatg tcttcttcgg gtctcacgga gccaatacga acgatgaact     2520
acagaaaatc gaagaaaaag tatcgccctt ttggctgcac acagcgatgc catctacctt     2580
aacgacaaac ttttccacgc gtaaaagccg tttacgaaag tgaccaatcc gccatcgaac     2640
ccgaggacaa aagttgatcc aagagtatta cgatgccttt gtccgtgccg gtgccatctg     2700
agtgccgagg acaaggccaa gctcatggaa ctgaacaagg aagagcttcg ctgacgaccg     2760
aattcggcaa caagctgatc gcagccacca atgcgcagcg gtaatcgtag ggagcaaaga     2820
ctcgctcgat ggtcttagcg aacggagata gccaaagctg caagcgatgc caaagctgcc     2880
ggccacgaag gaaatacctg ttgaatatca ccaataccac tcagcaggat tatctctcgg     2940
actgaacgac cgtaccattc gtcagcgtgt attggaggcc tctatccatg cacggacaaa     3000
ggcgatgcca acgacacgca gtccatcgta cttcgtctgc caggctccgc gcacagaagg     3060
ctcgccttct cggcttccct aattatgcgc atggaagctt cagaatcaga tggctaataa     3120
tccggagaca gtgctgcttt tgtccagtcg ata                                 3153
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```
ggaggtttgg gctcttgaag catttggagc ttcgcatatc ttgcaagaat tcttactgtg    60
aaatctgacg atgttgttgg acgttcaaag gcatacgagc gatagtcaaa ggagatccga   120
tgcctacacc gggtattccg gagtcgctaa cgtgctattg catgaattga aaggccttgg   180
tttaagtttt tctttgacta acttctaacc gagagtctgt acaattattt ttgccttcat   240
ccattctatt caagcaaagt gaactatggc ttttagaaaa gaaaataaga taaaaacaac   300
ttctcgaaga ttcgtatcac cttggcttct cctgaagaga ttctgagaac tcattcggag   360
aagtattgaa gccggagacg atcaattatc gtcctacaag ccggaacgaa gatggcctat   420
tctgtgaacg catcttccgg tcggttnaag gatttttgaa tggtcactgt ggcaaataca   480
agcgtattcg taccgtggta tcgtatgtga tcgctgtgga gtcgaggtaa cggaaaagaa   540
gttcgccgtg agcgtatggg gcacatccat ttggtcgtac ctgttgctat atttggtatt   600
tccgttctct tccgaataag atcggctatt tattaggcta cctaccaaga agttggatgc   660
catcatttac tatgaacgct acgttgtatt caaccgggtg ttgccgaagg gttgagtcaa   720
cttgatctat tgtcaaggaa gaatacctcg acaagcttga tgaaatagag cgcactcaca   780
agggaaccaa aatttggagg ataccaatcc ggacaaattt attgccaaaa ttgggcagag   840
gctatttatg atcttctatg tcgtgtggat ctggattcta ttcctacgaa ttgcgagatc   900
gtgccaatac agatggttcg cagcaacgta aacagaagca cttaaacgtc ttcaagtcgt   960
tgaaagtttc cgtgcatcca aggtgtgaat cgtcctgagt ggatggttat gaaagtgatt  1020
ccggttatcc gccggatctt cgtcctttag ttcctttgga tggtggacgt ttcgctactc  1080
cgatctgaac gacttgtacc gtcgcgttat tatccgtaac aaccgtccaa acgattgatc  1140
gagatcaaag ctcctgaagt tatcttacgc aatgaaagcg catgctacag gaagcggttg  1200
actccctttt cgacaactcg cggaatcaag tgcggttaag tctgacaaca atcgtccttt  1260
gaaatccctt tctgtagtct caaaggcaaa caaggtcgtt tccgtcagaa cttgcttggt  1320
aaggtgtcga ttattctgct cgttccgtta tcgttgttgg tccggagctt aaatgcatga  1380
gtgcggactt ccgaaagaca tggcagcccg aactctacaa accttcatca ttcgcaagtt  1440
gattgagcgt ggcatagtga agaccagtca gagtgccaag aagattgtag accgtaaaga  1500
gcctgttatc tgggatattt ggagtacgtg atgaaaggga catccggtcc t            1551
```

(2) INFORMATION FOR SEQ ID NO:342

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 3380 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...3380

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:342

```
gatccccgtg tgccaattag tcaatagaaa agcttccccg aaacatccaa gtcggccacc    60
gggttgaata tggccaaata gagtgtaagc ggagtcatac agccataaag agaaagatga   120
agcgagctgc catgcgtctg tagataccat caagagaaat gctcccacga tgaactcact   180
acagcaaagc aaaatgtaag aataagggat aagccctcgg acttaggcaa agcaaaaaca   240
gtaaatactc actgattttg atcgctcctc cctgcggatc gatagccttc agaagcccga   300
aacaacgaag gtcagaccta atatgattcg agaaagctca gcaggaaacg tttcatccgt   360
tcaactgtat caatgcgaag atggcatagt tgtcatatcc atgtagttgg catccacccc   420
ttcggatata tatgtatcac cccgagatct tctatctctt tagtgcgaaa taccttagtc   480
agaatcaagt ggcaaaggat gacacacgca tctgtctcca cgcctctcca tagtcatgat   540
cttatcaagc atcagcgaca tggcttcacg aatcttgagg tcatacagcg cagagcttcc   600
tctgtctcca tcttaggtgt gtcagctact cccagctcaa ttggatgaga gctattactc   660
cataattgac gacacctata aactcaactc cactccttca tccaccttac tcaaaccttt   720
catctgaata tttcgatgcg gttggccttg atataaagct gatcggtcag agacgacgga   780
cgcacactcg ccacgaggct ccatagtcgt gcagtttttt ctgaaaaacc tcagacaaat   840
atcaatcacg tgctcgaact gctctactgt atttggcttg gcgtagtcat ttctttcttt   900
gcttcttctc cgttttttcc actttttcgg tttctcctcc tcggtcttct tgccaaagga   960
```

```
atatatatcg gtggtatcga gactttctct tcgagcaaag cttctttcaa cacctcgtta   1020
atgttggacc atagtggaac ttcaagccct tcagatagat atcgtttatc tcctctattc   1080
cttgcgattc tcttcgcaca ggattatttc cgtgataccg gaacgttggc agccaatatc   1140
ttctccttga ttccacctac aggaagcacc tttcctttag agtgatttct cctgtcatgg   1200
caataccggc ccgcactttt cgacggtaag agccgacacc agcgaagtca ccatcgtaat   1260
acctgcactc ggacgtcttt cgggatagca ccttcgggaa catgtacgtg tacctgccaa   1320
ttatgaaaat ttcctgagag atgcccaact catcactatg ggcacgaata tatccaaggc   1380
tattacggcc gactctttca tcacatcgcc cagattaccc gaagcgtgag cttcggttcg   1440
cgtccgcggt gcagactcgt ctcgatgaac ggatctcccc tcccaccgaa gtccaagcca   1500
atccgatcac aacgcctgct cgccattgcc ttgatagcga tcgcgcgtat agcggggtgc   1560
tcccaagaag taaccaagtc ggacggttcc accttggtag tatgtaccac attcgtgcgg   1620
cctcctttgt tatcttacgg atcacagctg cgatctgctt ctccaagtac gcactccact   1680
ctctctggtg tagtcgtcga tcagcttttc tatggttttt tggagaactt gatgtcgttc   1740
tttctgaatc catgctccac aagtgctttg gaatcagatg gcgggcagcg atctccactt   1800
tttcttctat gattaaccgc tcacatcgat cagctccatt ctgtccaaaa gaggacgaga   1860
gaactgctca aactgttggc cgtagcgata aaaagaacat gactgaggtc gagtctatat   1920
ccagataatt gtcatgaaaa gcattgttct gctccggatc aggacttcga gcaaagcaga   1980
agaaggatcg cccttgtagt cgctgtcgac ttggctattt cgtcgaggac aaagacggga   2040
ttagatgtac ctgctcgcgc aaactctgaa tgatccgtcc gcacatagca ccgatgtagg   2100
tacgtcgtgt ccacgaatct cagcttcgtc atgcaagccc cctaaagaaa tgcgtagtat   2160
ttacgaccca agctctcggc aatgctcttg ccaagagagg tcttaccact cccggagggc   2220
cgtacagaca gatgatgggc gacttcatat cgccttcatc ttgaggacag ccagatgctc   2280
tatgattctc tcttttactt tctaagaccg aaatgatctc tatccaaaac ggattgggca   2340
cgcttcaggt tgaattatct ttactgaata cgccccacgg cagactgatg atggtctgta   2400
ctactgcatc tgtacggagt agtcgggcga ttgaggatgt agccgttcca cttgcggagt   2460
tcttttcga aagtttctgc tacctcgctg ctccacttct cgtagcagct ttggtacgca   2520
gctcctgcac ctcgatgtcg tttatattcc acccagttcc tcctgaatcg tcttgatttg   2580
ctgctgcagg aagtacttt ctgctgcttg tccatctcct cgcgcgtctt catctgaata   2640
gaagcttcag ttccattacc tgaagctcct tgtgcaacag gtagagaaga cgataccacg   2700
atccttcatc ttgctgattt ccagcaattc ttgcttgacg gctagctcgt ggatatattg   2760
gccgatgcaa agttgatctg atacatcgga ttctgttccg tctcatcgag aggataagct   2820
cccgaggggg tctctcgacc atagctccat catcttcaga ctcatatcct gtatggtgga   2880
gacgagtgct tgaactcgtg atctttgttc ttcccgggga gaatgtctgg gagcagcttc   2940
cgcgaccctt cataaaaggt tccgtagccg ttatctcctg cagtgcaaac gctggcggcc   3000
ttgtacgata gccgtggtag taccatcggg catctccaca ccctgatgat ttcagccacg   3060
accccgacat catacaaatc ggcacgaccg gttcctccac atccatatcg cgctgtgaaa   3120
cggcaccgaa atagacccct tcttctccac gtagcggatc agcttgagtg atttttctcg   3180
tccgacatga taggcatggc cacaccgggg aagagaatca tattgcggag agccaaatcg   3240
gcatctcctc ctgcatatga tcttctttca cctgaaatcc tcacttcttc acaaacggaa   3300
agcaccggaa agaatacggg gaaccatcat cccgtcgtcc tctccaggcg tatatatttc   3360
tatcatcatc tttagtcttc                                                3380
```

(2) INFORMATION FOR SEQ ID NO:343

    (i) SEQUENCE CHARACTERISTICS:
       (A) LENGTH: 781 base pairs
       (B) TYPE: nucleic acid
       (C) STRANDEDNESS: double
       (D) TOPOLOGY: circular

   (ii) MOLECULE TYPE: DNA (genomic)

  (iii) HYPOTHETICAL: NO

   (iv) ANTI-SENSE: UNKNOWN

   (vi) ORIGINAL SOURCE:
       (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

   (ix) FEATURE:
       (A) NAME/KEY: misc_feature
       (B) LOCATION 1...781

   (xi) SEQUENCE DESCRIPTION: SEQ ID NO:343

```
ctgctcccga ctcttgagga tccccggggc tgtgtcaaaa tcgaatttca cacaacccgc    60
attgttattt gtaggacttt gtgacccggg cgggattcaa cccgcgacct tcagaaccgg   120
```

```
aatctgacgc tctattcagc taagctacag gccttttttgc aaaacaaaag tacgaaattc    180
tttctgtttg agattgtttt tctcaaaaca gcttagcgct tgcggcggaa aaagaagctc    240
agatgttcat aatcgacttc ctgctcccgt agtaatgctt catgatcaaa aatcctcttt    300
gagagaagcc ttatgattt tgtaagttat ccccccccta tcaccaaaga gtgcaccaga    360
atcatttctg tattgacgat attgcgagca gctgaagaat acgaatacac caatcgaaat    420
cagctgaaaa tcggtatttc agttgtacgg cggtgctatc aatcgctttg caataaaagc    480
ctgatggcat ccaacatacc atccgcaaaa cttctccatt ggagttcgaa aggaggacga    540
gccgtcgtaa accccttctcc ttaccggtgg catcaatcag catggtatgc cgtaaaggac    600
atccggtaat cccattggag agcttttaat gccgttgcta tcgcctcgac aagatcatcg    660
gatggcagaa ggtcgccggc attcagaacc aaacatagtc gcccaaagcc atacgcaggc    720
ccttattcat agcatgtata gccctttgtc cggttcgctg atcagtcatg atatcagaag    780
a                                                                    781
```

(2) INFORMATION FOR SEQ ID NO:344

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 364 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

   (ii) MOLECULE TYPE: DNA (genomic)

 (iii) HYPOTHETICAL: NO

  (iv) ANTI-SENSE: UNKNOWN

  (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

  (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...364

  (xi) SEQUENCE DESCRIPTION: SEQ ID NO:344

```
cagcaagctg agatcgtttg gcgcgcaagc gtgcgatacg cttcgtcttg gtataatggt     60
agcaatagct caagagacgc gctccaagca gagaagcata aagaccgtat cgttgccatc    120
caaggggcta tacgaaaaca ggaagcctct ctataagcag tacgatgtag atccttaatc    180
acaaattgag ccgccggaga gcaacatcaa gatactcctg ttggcgtgta acctcatacg    240
cctcctcaga gccgtagcgc agaaattcgt agccacaacc gtcggcgtat atttgggaaa    300
aggaaaagtc tgcgcgcttg ccaatcaaaa ttgtaccccc agcagcccca ctatagtcac    360
cagg                                                                 364
```

(2) INFORMATION FOR SEQ ID NO:345

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 666 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

   (ii) MOLECULE TYPE: DNA (genomic)

 (iii) HYPOTHETICAL: NO

  (iv) ANTI-SENSE: UNKNOWN

  (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

  (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...666

  (xi) SEQUENCE DESCRIPTION: SEQ ID NO:345

```
aaacacatac caccatgaaa gttaaatcta ccggcgcatc ggcacggnag atgtattccc      60
attccgagtc catcgcgtca aagaagtagc cgtgcgctct ttccgcacct tactccgaat     120
tccggtacac gtgctctgcg aagaatctct atggggatca agatctcctc aattcgatga     180
gagaacatgg ttatgcctgg gacagagatc cttgacaccg gctatgctca acgtccttac     240
agccttcttg gttcgcccga agattttgt ccttgacgga caatagctga aagttgctta      300
taggggggtat gtcgaagtcg tgatttgcgg cttttcggcat accccttttca gtatatgcaa    360
agaggatgtt tagatgtgag aggtggaaag gtttcggcaa aggcggctac attctccgat     420
ggagtagccc atgaagtgac cgacgaatgg ctgagctgtc gggtgatacg gcttgccaca     480
cgtagaagtc aatacggttt tcagtctttc gatcagatcg ttggggagga tcgggaagac     540
tggttggttt gcggagggta gaggaaggaa taaccgcaga aggagatact gtcgccagat     600
ctgctgccat tctgttggca tgagctgcaa gccggtataa agcccatcgc ggaaaagcgt     660
ggcaaa                                                                666
```

(2) INFORMATION FOR SEQ ID NO:346

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 587 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...587

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:346

```
aagaagcatt tccatctgac gctgcatgcg gctgcttctc cggcaagctt agcagcaaac      60
ccctccgtat tatccgcata gatgatactg cgcgaagctt gacgagcaga ccgcaatgag     120
cattcatgcc gtactcggcc acatcttcag acttccaccc tgagcaccta cgccggggac     180
aagcaagaaa gcgtccgcac gatctcgcga atatctttca gcatggaggc ctgcgtagcc     240
cccacacata catcagttga ccggcattat cccacgtctg gctgatacga ataagcgttc     300
gaaaaggtat tctccatcgg catcgcgcat catttgaaag tctgcgaacc tttgttcgag     360
gtcagtgcca gaagcaccgt gaacttgcct gctaactcag gaaagggctg atgctgtcct     420
ctcccatata aggagaaacg ggagggcatc caccttgaga tgctcgaaga acgaacgggc     480
atacatatca tcgtattgcc gatatctcca cgcttggcat cggctatgat aaattgatcg     540
ggtatcgctc tcgaatgtat tcgatcgttt tttcaaaaga gtgagct                  587
```

(2) INFORMATION FOR SEQ ID NO:347

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 1000 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:

```
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...1000
```

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:347

```
ggtgtctgtc taatttggtc tcttccctgc ggatcaacac tttcaccaaa ttgatctgaa      60
gcaatggctg aatgagcctt ttactcctcc accggagacg aaaatcagct cttttgaatag    120
gcaggggggga tccccctaaa atcaaaaatg atagtcccgg agttattcca ctccgggact     180
aagaactcgc atcccctaaa aaacatttag gatactattg gtctataggt caaattgcag      240
gctgtatgat tgagttgtgg ttctatagat caaaatctca aaccaaaatc tccaaaaatg      300
gcgcgagaat cttttcgttc cggcgcgaga tttttttcaac tccgaaccaa aataaaaatc     360
ttctcagacc acgttttttca gaaccgaaat accgtcaagc tattttcaga agcgatacga    420
cattgtcatt gctaatctga attagagcga gtgagttttg ccggtgcagg agattccact     480
tccaacacat ggccggattc gggtcgtccg ataccattcg gccaaaagta tagtagtaat     540
cttctcatta cgatagatca cagccaaatc gcccgaaaga ttacgcgtaa acggtaaccc     600
aagcctcctg tcacggtata ggaattgccc ggaagttgta atgaggcata gcccccatag     660
ggaagacggt cacctgtgcc gagccgcgaa agctttcaat tttttcattt taatgggatt     720
ggaagtgtgt gaataccggc acgcagactc agacgcgata tgggacgcag ttctcctccc     780
aaacgatggt gtggcgtgaa ccaaaatcct ctgaaatgaa cttattatca acgatgccgt     840
accgttctca tcctttaatt tgatctggcc gnaagattcc aatcataatc catactgaga     900
aggccgattt tgccagcaac gactgccaaa cagccacaaa tcgtcccgga ctactcattt     960
gataagtatt atacgattcg gagtctggct actcatgaag                          1000
```


(2) INFORMATION FOR SEQ ID NO:348

```
    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 940 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...940
```

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:348

```
acgcatcccg tcccatcagc atacagaggc gtatgtacac ccctcgtgag ggaacttcca      60
aggctgtcta tgtagccaac ggaancagag gagggaagat aactacggag tcgctgtaga     120
tcttaccatc gtggatcgtg atggaaaccg ttggatatgg gcactcctgt cgatcacttt      180
ggccgagcgg cacatggggt caggaagaac gcttggccgc agacggcctg atcagccgag     240
aggcttccgg aaccgccggt tgctacgtcg cataatgaag tcggtcgggc tggtccctat     300
cgcagggagt ggtggcatta cgaactgccg gagagcatga gcccacccgc tcacattatc     360
gcttgctcga ctttttaatcc ttgttcttgt ttccgagagg tctgcaatgc ggacatcatg    420
gaaatacgaa ccaaaaatcc tcgattgcgg ctcgtgtttc ctgaaaaagt ggcgtgagat     480
tttttttcgtt tggcgtgtaa attctttaat tgccgtgcca aaacaaaaaa attctcgcgc    540
atgttttttgt ggggaacaaa tgcgaaaatt ccggnacgca aacctaccga tatgaaatga    600
tgtattccgt tgtacttgag accggagtgt gcaggatctt ctctccaaaa tgtacttcgt     660
aagtgaaat tagcttactt tgttaatata aacaaagtag tacagtcgga aaaataaagt       720
atcacaatac tcacttaagt taaaattatg gcaaagaaa aagaaaagct cttttccgaa      780
ttcctccggt ttcgagagaa gcctggatcg ataagataac ggccgatctc aaggggttcc     840
ctttgagaag aagcttgtct ggcggacgaa cgagggcttt aagtcaatcc gttttatcgc     900
agagaggaca tcgaggatct gaagacaacg attctcttcc                           940
```


(2) INFORMATION FOR SEQ ID NO:349

```
    (i) SEQUENCE CHARACTERISTICS:
```

```
        (A) LENGTH: 905 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...905

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:349
```

```
ttggaaaatg aaagggaata agtttgccgt cataaaccta acgattgctc gttcggttat      60
caaacaagta cgaattaatg ggacctttgc acaatgagag gcacttttgt ttattcttct     120
tattgtgtgt caggcgacta tttggtaacg ccgaatttcc acaagtggaa agctatcttt     180
ccaccagtgg aaagtttgtt tccaccagtg gaaaaagaat tttccacttg tggttttggc     240
gaaaattcca taagtataga atgagagcta tattgtcttc actttcccaa tctctgggtc     300
tttggggcaa atcagtacaa acagcatgga tagaaatctt ttcaggaata ttatgccacc     360
ggctttagcc attgctatgg tgtggcacat cgaacgagca cggtctgcac gtaaagagtt     420
attgggcgga gagcatccgg atgagacggt agcgtatttc cgccccgatt cacatcatag     480
ggaggattcc ccggctttgt ctatggaggg ctgattgccg ctatccttac tgccatggca     540
atggtaccgc agccgctgca ggttatcgtt ttcaaagcgc ccgatggatt cggagccgaa     600
tctgagatac gtgacagcta atctgatctc aactatcgcc gtcctacccc gatgggagta     660
gacttggagc tacgccccat atcaaagagg taacggaccg gaaagtactg atggagctat     720
cgctattgca gaagggcagg taacggtgga agggagcatg ctatccgtcc tgcgcccgaa     780
aagaagtatg ccaagcaaac ggagagggca ggatataaaa cggctttgcg actcaagcat     840
agacg                                                                  900
                                                                       905
```

```
(2) INFORMATION FOR SEQ ID NO:350

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 745 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...745

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:350
```

```
tggagggatc ccccttgatg atactaccca tcattcgtcc cataagcaca agttgtcgcg      60
atcagcccat tcgccccgat agagatccat ggctcgccat agttgccctc tgccaaatgc     120
gctatgcgga tgatgtcggc cgtgtttcct gattgttacg agacaaggct tccactattt     180
cgatctcgtg cagcaacgca cgttgatcag ctgtgtacgg ctcctgatcg ttcccaacac     240
cttgtcggct cgctgctgat cataaagaag agcgtatgct cgggcggctc ctcttcagct     300
tcagcagttt gtttgccatg gcttcattca tccgctccgg ttgcaaatca tcaccacacg     360
atacgaggct tcatagatgc ggaagctgag ttctgctcca cggcttcggc ttccttgctg     420
```

```
taaatgatgg gttggctgtt gcggctttga tgtattcgag ccagtcggca ggggtaaagt      480
aggattccga ccgagcatct cgcgccactg acggatgtag tcatcgctcg gtgcaggcga      540
gaggacgcgt ttacgacagg atagacgaaa aacagatcgg ggtgtgccgc gcatcgtatt      600
tcacacacga cggacaatga ccacaagcat ccgtatcgtc ggcatctggc agttgagata      660
gcgtgcgtag gccaaagcca aagggaagcc cctccccct cttctccggc aaagagctgt      720
gcatgggcta tctgctcgtc tgagc                                            745
```

(2) INFORMATION FOR SEQ ID NO:351

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 534 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...534

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:351

```
cagaaataac ttatcaaaag caaactcctt gattatcatt ggatatggtg taaagataaa      60
ggaataaatg aaatgataaa ggacaatttc gattacaaaa taaaccttca ttcattatcg      120
acaagtatgc aggtgcctcc gttgaaaatt cgctcaaaaa attaatgcta aaattattaa      180
ggaatctata gagagataga taaaacatgg tttgtttaat gcaaagaggt aagagtgtgt      240
gtcaaatgac acacactctt taaaaataaa ttattgctaa atactatttc aaatttcaag      300
gtcaattttt ctatcgtgca agtgtagcac acatttgtcc actctccatc ttgaatacaa      360
atggtcagtc cgtaatcttc cccattgaaa tcatccaacc aaaaggcgac attgcctgaa      420
cagggatatc cccttaaaac atcttatcta ctgattggct gacaatttcc gcattggctt      480
gggagacatc gcacattggt ttggccaaac tgggtgcatg ccatcccaaa ttat           534
```

(2) INFORMATION FOR SEQ ID NO:352

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 540 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...540

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:352

```
gatttgagca agttagactc ttatctcacg gctgaaaaca tctcttttca gaggtttcgt      60
atgaaaatct tcaacatttc gtagccgaat tgtatgactc ggcatcagtg cgcgctcgat      120
agcgcgtatc atcagcggtg tcaagagttc ttccgcttcc tcgttttgga agagtatatc      180
```

```
gaagcggatc ctaccggttg ctcgaaggcc ctcgcatcgg tgtccatctg cctacggtat      240
tgacctcgaa gaagttgatc gactgatcgg atcgatcgat ccggcagctc aggggcccaa      300
cgcaatcgcg ccattctgga aatactctat agctgtggtc tgctgtcagc gaactgactt      360
ctttgaaatt cagcaatctc ttcctcaacg aacatttttg cgtatcgatg gcaaagggcg      420
caaacagcgt cttgtaccca tagcgagact gctatcaccg agctgaagcg gtatctgtcc      480
gatcccgaac cccgacccct gttcttggac aagaggagta tgtgtttctg agcaatcgcg      540
```

(2) INFORMATION FOR SEQ ID NO:353

      (i) SEQUENCE CHARACTERISTICS:
          (A) LENGTH: 843 base pairs
          (B) TYPE: nucleic acid
          (C) STRANDEDNESS: double
          (D) TOPOLOGY: circular

     (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

     (iv) ANTI-SENSE: UNKNOWN

     (vi) ORIGINAL SOURCE:
          (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

     (ix) FEATURE:
          (A) NAME/KEY: misc_feature
          (B) LOCATION 1...843

     (xi) SEQUENCE DESCRIPTION: SEQ ID NO:353

```
tcttcagcac acggtcatag acatcttgat gaagaaactt cgccaagcgc caaagatcat      60
agcatcaaac aagtggcctt ggccggcggt gtatcggcaa taccggactg cgcgatgctt     120
ttcatgacca tgcccgacgt tatggctgac tgtattcatt cccaaattcg cctatacaac     180
ggacaatgct gctatgtagc catttccgga tactataagt acttgcaggg cgatttctgc     240
cccatgatgc tgttccattc tcgcgcatca cggtctgatg gataatcccg ttattccgaa     300
ctggcgaagc tcttgactga gcgaggcctt acattggcta ctgcgagagt tgcaccggag     360
gaactattgc ttcggctcta actcattgcc cggaacctcg actttttttca gaggttcggt     420
cgtggcatat cagaacgaca taaaatacgc cttttgggag tgtcccaagc cgatattgaa     480
agccatacag agtcagcgag cctgtggcac gcagtatggc tgtgggtgtt tgccgtctgt     540
tgatgccaat ataggaattg cgactacggg aatagccgga ccttcggggg ttcggatctg     600
gtgccggtcg gcacagtttg gatcgctctt gtcatcgtga ggacactttc gcgcactgtc      660
tgcatcttag cggtactcgt gaggagttat cgctcaggcc accgatcagg cacttttgac     720
tatatttgac ctctgaaaaa caaattgtga ccggtataaa tccaataaaa atatcagcag     780
aaataagatg aaatcggtta tttgctatag caatcgctac attgcttttc agcacagcga     840
cct                                                                   843
```

(2) INFORMATION FOR SEQ ID NO:354

      (i) SEQUENCE CHARACTERISTICS:
          (A) LENGTH: 810 base pairs
          (B) TYPE: nucleic acid
          (C) STRANDEDNESS: double
          (D) TOPOLOGY: circular

     (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

     (iv) ANTI-SENSE: UNKNOWN

     (vi) ORIGINAL SOURCE:
          (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

     (ix) FEATURE:
          (A) NAME/KEY: misc_feature

(B) LOCATION 1...810

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:354

```
tcctgcgcaa agagggttat ccgcgccatg cactggtttg cgaacgccaa cgggttcagg      60
attgacttcg gaagacattg cagccagaca gattgcactc ctccgggtat ttatacccct     120
cagagtattg aggagaaaat tgtttgtatg ccgataagtt tttctccaag acaaaactcc     180
atcgtcagaa aaagctgaag acgtcaggcg cagtatgctc tcctacggag ccgatagcct     240
ccgcctttcg acgagatgca cgccttattc aaaatcccat taggataaaa gtcaaggaat     300
atcaggaggg tggcccgaat aatctaaagg attctcttcc tgcgaaaatc tgctttttga     360
aatagtacag aagcctcata atcaatggat cgtgaccgac aaattacctt ttgctctcta     420
ttcgcggtgc gtcaaagccg gaaacgtttc tactacattg atgccaaacg cgattctaaa     480
ggaaatgact tctggtgata acggaaagta acagtgccga agaaggttct gcaatgacgg     540
gcataaggtt ttcctctatc gcgaagattt tgccaaattc acagaagctt tttggacgtg     600
ctaaagtctt tcgaaaagag gagcggagta tccggatcga acaggcgatc ggtttgtctg     660
aattggagca gagcctttcc gatatgcaac gggagtggag ggtttagcag agtcctccga     720
ttctattttg gaggagatga accgctgaaa atagatttcg attttttgatc ttcctcccat     780
ttcccctctc caaggaggga ctctcctccc                                      810
```

(2) INFORMATION FOR SEQ ID NO:355

        (i) SEQUENCE CHARACTERISTICS:
            (A) LENGTH: 414 base pairs
            (B) TYPE: nucleic acid
            (C) STRANDEDNESS: double
            (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
            (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
            (A) NAME/KEY: misc_feature
            (B) LOCATION 1...414

        (xi) SEQUENCE DESCRIPTION: SEQ ID NO:355

```
gaagcattac agtactattc cgtaccggcg actaacacgg tcatcactat gccgatggta      60
aacgttatcg ttttgtcgaa gtcccaggct ccacgccgat ccgggccaaa tcggtatcag     120
ttggaaaaaa ccggcaggaa acgcttattc gcttacaagc tcctcaatta ttggatggga     180
ggaacaacag accaacgagt gaatgggatg tgacgtccaa ttggacagga gcccaagtac     240
cgctccagga gaagatgtag agtttgcaac gacagaaaat ttcggttctc cggcgtagcc     300
gatttgcatg tcccgacaac caaccccaaa attatcggta acctatcaat aattcccgac     360
aagggattta gtttgtttac cacaaggcag tcatttggac gaatcaaccg ggcg           414
```

(2) INFORMATION FOR SEQ ID NO:356

        (i) SEQUENCE CHARACTERISTICS:
            (A) LENGTH: 590 base pairs
            (B) TYPE: nucleic acid
            (C) STRANDEDNESS: double
            (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
            (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
      (A) NAME/KEY: misc_feature
      (B) LOCATION 1...590

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:356

```
tgctttatgt tgaatttggg caatttgtgt taaagcgtat atatcgaatc ctcgacttct    60
ttaaaaagaa tggcaggaaa atcccctgaa aaataaactt atctgcacca attttttccca   120
actcctggta ttcaggatta gaggtcgtat tcctgaacat ctcactaaat gctcatagcc   180
taatttctta tagaaaaatt tgtactcatc tatttgacac tacatcagaa agctcaaggg   240
agcactccta tatccggcaa agatacgaaa aagagattat atcacaatgt ctaagtggat   300
ttatttcagg attgaagttg tatttttctg ttatgtaatt taggtaaaca caaatgctga   360
gcattatgta atacagagat gagaaagacg atgttaaaca aataagggtg tttcggaagt   420
gcttgctgag cagagaggac aacagcagaa agtcctgcat gattgcagat tgataataga   480
tggaggaata atagcacgtt acccgatgaa gaaaatcaac ccgtgcattc gatatctata   540
tgaaaagcgg ataggcgaga ttggtacagt ctttttggtc ggtgagccgg               590
```

(2) INFORMATION FOR SEQ ID NO:357

      (i) SEQUENCE CHARACTERISTICS:
           (A) LENGTH: 421 base pairs
           (B) TYPE: nucleic acid
           (C) STRANDEDNESS: double
           (D) TOPOLOGY: circular

      (ii) MOLECULE TYPE: DNA (genomic)

      (iii) HYPOTHETICAL: NO

      (iv) ANTI-SENSE: UNKNOWN

      (vi) ORIGINAL SOURCE:
            (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

      (ix) FEATURE:
            (A) NAME/KEY: misc_feature
            (B) LOCATION 1...421

      (xi) SEQUENCE DESCRIPTION: SEQ ID NO:357

```
ggacgaggtg caaattcggt ggcacttttt tatatctttg tcccgagaca tttgctcgaa    60
tctcagcaaa cgaagtcttt caatcactta aaaacagaag ttatgacagt aaagcgcgca   120
gtgcgaatag cacttctcac gctgatagca ttctttttc ctcaccttct cttgttcggg    180
cgcaaagtct tttcagaccg aacatgtctt gcaactatac aacaagatac tctatggaga   240
gtcggggcgg ataccgtcgc agagaaaacg gcaggtgagt cggcatttcc tttttagaca   300
aactcatcaa tctnggccgc actttcctcg gcaaaccata tcgtatcgcg gtccttcccc   360
atggccgatn gactgctcgg gctatgtgtc ttacctntac tccaaaattc gacatcaaac   420
t                                                                    421
```

(2) INFORMATION FOR SEQ ID NO:358

      (i) SEQUENCE CHARACTERISTICS:
           (A) LENGTH: 651 base pairs
           (B) TYPE: nucleic acid
           (C) STRANDEDNESS: double
           (D) TOPOLOGY: circular

      (ii) MOLECULE TYPE: DNA (genomic)

      (iii) HYPOTHETICAL: NO

      (iv) ANTI-SENSE: UNKNOWN

      (vi) ORIGINAL SOURCE:
            (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

```
    (ix)  FEATURE:
          (A)  NAME/KEY: misc_feature
          (B)  LOCATION 1...651

    (xi)  SEQUENCE DESCRIPTION: SEQ ID NO:358

gaattcttta tcgtctaacc atttccggca caagatcaat acttcccaaa tagcttatga      60
gcaagatcag cttcaaaaac gactattctg aaggtgcgat cctgacatac tgcatgcgct     120
gacagatacc aacttcgttc cacaagagga tacggctatg actcctattg cgaggaagcg     180
cgtgcgatga tccgcctgaa tgcaataagc ccgatgccga ggtccatttc gtatcgggtg     240
ggacaagacc aatctcttgg caatcagtca cctgctccgt ccgcacgaag ctgtatagca     300
gcacagtcag ggcatatcaa cgtacacgaa accggtgcca tcgatccacc ggacataagg     360
tttgcacagt acctactcca ctcggcaaac tcgtgtggag catatccgcg aagtccttgc     420
ttttcatacg gacgaacaca tgtaaggccg tccatggtct atatctccca atccacagag     480
ttgggcacac ctattctcgt catgagctgt cggatctgtc caccttttgc cgtgcaaacg     540
tctcctactc taccttgacg gtgcccgtat cggttcggcg atcatggnga gacagaggac     600
aatccgaccc tgaccgatat agccaccctg accgatggtt ctacatcggc g                651
```

```
(2)  INFORMATION FOR SEQ ID NO:359

    (i)  SEQUENCE CHARACTERISTICS:
          (A)  LENGTH: 2441 base pairs
          (B)  TYPE: nucleic acid
          (C)  STRANDEDNESS: double
          (D)  TOPOLOGY: circular

    (ii)  MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv)  ANTI-SENSE: UNKNOWN

    (vi)  ORIGINAL SOURCE:
          (A)  ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix)  FEATURE:
          (A)  NAME/KEY: misc_feature
          (B)  LOCATION 1...2441

    (xi)  SEQUENCE DESCRIPTION: SEQ ID NO:359

gggaaatcga ctcttttaa ttgtttgtcc aatgccaagg cacagtctgc aatttcccct      60
tctgtaccat tgatccgaac gtcggtgtaa tcacagtgct gatgagcgac tgaatatcct     120
ggccgatctg tgcaaacccc aacggctatc ccaaccacgg tagagatcgt agatattgcc     180
ggtcttgtca aaggcgcagc aagggcgaag ggttagggaa taaattcctg gccaatatcc     240
gtgaacggat gcgatactcc acgtgctccg atgcttcgat gatgacaata tcaccacgtg     300
gacggatccg tagatcctgt acgcgacaaa gaaatcatcg acacgagcta caactgaaag     360
accttgaaac gatagagagt cgcatacaga aatccaaaag caggcacaaa cagggggcga     420
caaacaagcc aagctggctt acaagtgctc tcgaaattca aagaagctct tgacgaaggc     480
aggaatgctc cagcgtcagt ttcgacacca aagacgaaca gcaaatagca cgcgaactct     540
tctcctgacg gccaaaccgg tcatgtacgt ttgcaatgtg gacgaagctc tgctcttagt     600
ggcaacaaat atgtggaagc cgttcgcgaa gcagtcaaaa cgaagatgca gaaatcctcg     660
tcgtagcagc caagatagag agcgagtcgc cgaactggag acatacgaag agcggcaaat     720
gttcctcgaa gagatggtct gaaagaatcc ggcgtgagcc gtctgatcaa agccgcttat     780
cactgctgaa tcttcaaacc tactttacgg ccgggagcga tgaggtaagg gctggacatt     840
cctccgcgga agcaaagcac ctcagtgtgc cggtatcatc caaccgattt tgaaaaaggg     900
tttatccgtg ccgaggtcat caagtacaat gctttgtcag tcttggcagc gaacaagccg     960
tgaaagaagc cggtaagatg gtgttgaggg aaaagaatat gttgtgcagg atggcgacat    1020
catgcatttc gcttcaatgt ctgaagtctt tctttcatcc ttatccttct cgataacaaa    1080
acacagtacg gcattcggaa taaccgtata tcccggcgaa agaaacaaaa ccaaaagagc    1140
gggtcggctg ttcttttgca aagttatggt tcaggattca gcgagtatcg aacaaatact    1200
cctgcatttt tcttaagtag aaaaataaaa ctgcgcaaac aatatggcga acaatgggaa    1260
taacaagaaa cccgaaaacc gatgcgtttc aacccgatat ggctctatgc ccctgtattt    1320
ctgtattggc caccctcttc tttgtcgatc gggatattac atcccagaaa gactcagctg    1380
gaattgagtt tcagaatatc gccaaaaaag caagcctttc cgatatcgta gtcaatcgga    1440
aagagaacac tctcaaggcg agggtcgatc ggccaaggtc gattcggtat tcaagaaagg    1500
```

```
cgacatcccg tcctttcaga cagaggaaat atctcagact actatatcaa cacgcaaatt      1560
ccgtcggtga caaattctcc gacttctacg accaaaacca aattacggct aaggtgagta      1620
tgaagacagc aagttcagct tcacctctat cctcattaca tggggccact catcctttg      1680
ctcgttttct ggttttggat gatgcgccga atgagggcgg tggaggagga agtggcggtg      1740
gaggcggcgt cttcaacgta ggcaatccaa agccaagctc tatgacaaga ccaatatcca      1800
cgttacattc agcatgtagc aggtctgcat gaagccaagc aggaagtgga agagatcgtt      1860
cattcctcaa gaatccatcc aaatacaccg aactgggagg aaagatccct aaggagcttt      1920
gctcgtagga cctccgggaa cgggtaagac tcttctggcc aggcagtagc cggagaggcg      1980
cacgttcctt tcttctcttt gtccggttcg acttcgtaga gatgtttgtc ggcgtaggag      2040
cctctcgtgt tcgcgacctt tcagacaagc caaggaaaaa gccccgtgta tcatcttcat      2100
cgacgagtcg acgccgtagg gcgtgctcgc ggcaagggca acaacttctc cggcaagatg      2160
agcgtgagaa tacactcaac cagttgctta ccgaaatgga tggctcggct ccaatagcgg      2220
tgtgatcatt ctggctgcta ccaaccgtgc cgattgctgg atagtgcctt gctgcgtgcc      2280
ggacgtttcg accgccagat ctagtagatc ttcccgacct gaatgaccgc aaagagatct      2340
tccttgtaca cctaaaccgt tgaagaccga caaaagtgta gatgtggaat tcctgtcgcg      2400
caaacacccg gcttctccgg agcagacatt gccaacgttt g                         2441
```

(2) INFORMATION FOR SEQ ID NO:360

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 549 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...549

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:360

```
agcaaaggac aaattgaaag aaagccatcg acaagtaatg gcattgatca gacattttcg       60
aacgatgaat tatttgccaa gggagtattc gactggacga tacttcgact ctcggtgcat      120
actgcgtatc agccacttcc agtcattcga ctgggcgatg aagaaaataa agctacatat      180
caagaccggt aagtgacgga tgcgaagttg tttgtgtgcc aaatgctctt tcttcttgca      240
gtatttatta tgggcaaagt ggcagtacag atctctccta aagagggtat ttttgctctt      300
gtaacagggg cttctcacag gtgaagacaa tggagcttcc ggatcatggt tgaaaaaacg      360
tatgaaggat agggaactca ccgcagaaaa tcgaccgttc gtaccttgag tgaaaaacgt      420
gagcaaaacg gatgtaagcc cgtagaaatc gtcagcccga ctgacacaat cgccaagtat      480
gggaagttgc tcgttggtaa gtatcatttc cgcatctatc ggctatctcg tatcgatgga      540
gagctgaac                                                             549
```

(2) INFORMATION FOR SEQ ID NO:361

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 5015 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:

(A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
(A) NAME/KEY: misc_feature
(B) LOCATION 1...5015

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:361

```
cgctatcgat aagctccaag aaaaagaaat ctcctacacc aattgcagaa tcgaaagtgc    60
ggtatcgctt atcagtgagt tttccgcccc cacnttttca tccttcaagc atacgaaatg   120
cctgtggcat agcttcgcgc ggtacacgat cgaagcttgg caggctgctc ttgccggtga   180
tcccggatcg gcttttgcgg catattggtg acaaatactc ctatcgatag ggagacagct   240
caggaatcga caagattttc ttcgaggtga tcattgctcc cgactacgat aatgtgccat   300
ggaatatctg acacgcaaga cgaacaggat tatacttcta cagaagagcc tgtacgtgag   360
cagtggcagt tccgctccat gtttggcggt gtctcatgca gcaggtggat ggtgtgacag   420
ccaagactgt cgatttcaag ctgtaacacc cgtagtgcct acagcagatg aaacggacga   480
cctcatcttt ccaataaggt agtgaagcat agcaagagta atgctattac tttggtcaag   540
atagccaact ttgtgccagt ggagttgggc agacctccag agtcgatgtt tgcgacaggc   600
tatcgataaa gcacggaatt tcggctttga cctgaatggg ctgtcatggc cagcgatgct   660
ttctttcctt ttgccgattg tgtggaatag cagccgaagc aggtattcgc gctatcattc   720
agcccggagg ttccataagg acaatctgag catcgaagag gccacaaaaa aaggtattgc   780
catgtgatga cgggtgtaag acatttcaaa cattaacaaa aacatagaaa atagcctgtc   840
gcaagagaat ggtcggggta tagcactccc gtaccgtcac aacacaggaa atgcttttct   900
acagatacag aacaagatgg gattattttc tttcgacagg aattggccat tgacttaggt   960
acggctaata cgataatcat aaagatggta aggtcgtctt ggacgaacct tccgtagtag  1020
cattcgatcc cgcacggatg aagtgatagc agtagggaca gatgctcgtg agatgtatag  1080
aaaggacacc agcatatcag gacagtacgc cccttgcgag atggtgtata gccgacttca  1140
aagctgccga gcagatgata agcggtatga tccgtagatc ggtaagaagc atcgctggat  1200
ccatccatcg ctccgcatgg tgatcgtata ccttcgggta gtacgaagt cgagatgcgt  1260
gccgtgcgcg actcagcgag catgcaggtg ggcgtgacgt atatatgata tatgaaccta  1320
tggtgctgct gtgggtatcg gcatcgatgt attggctccg gagggaaata tgttgtggat  1380
ataggtggag gtacaacgga gatcgccgtc atttcactgg gggtatcgtc atggaccagt  1440
ccattcgtgt agccggtgat gaactgacca tgatattatg gactatatgc gccgcgaaca  1500
caatgtaaag atcggggagg tacagctgag cagatcaaaa tcaatgtagg tgcagcttcg  1560
gaagacttgc ttcaccgccc gagacctatc tggtctgcgg tgcagaccag atggatacct  1620
tccgaggaag atacccgtaa gttataagga ggtggcacat tgtctgagaa gtccatcgtg  1680
aagatcgaag ctgccatcct caaagcattg gaggaacccc tcccgaactt tatgccgaca  1740
tcgtaaggaa cggtgtattc ctgacggagg aggagctatg ttgcgcggtt tggacaagcg  1800
tctgaccgat cgttcggtat cactttccaa gtagccgatg agcctctgtt ggctgtagcc  1860
aaggcacggg gattgcgctt aaatacgtgg acacattcaa cttcctgatc catagagata  1920
gtccgaaaaa ccttcttcca gcatgctcta acatgcgtaa ctcattgagt ttatagtacg  1980
tcatcaacat tggctactgt ttcttttcg gagacggtag cctttgtcgt actcttcaac  2040
gatagcatct accatcgacg cagggaatgg cggtagccaa tgccctgacg gggcgcatca  2100
atagcctacg ggcgaagtgc gcagttatat gagtctgcgt gagaaaaatc gtatgctctc  2160
gatgccaatg cacggttgga gttggagtac atttcgctca agagactgtt gatgcagccg  2220
tagccgattc tgtacgcccc ctactgttcc ggccgattcc ctcaatccgc aaccggtgga  2280
gatggactac ctgagagcac aggggtcaat gcctcctata acagggtgga gaatttcatg  2340
accatagata aggacgagcc gatggtgtac tgccggaaat gggtgtagtg tcggctacgg  2400
ggtggtgggt gccgtaacgg ctgcttcaga tcattatgct attgtgatcc gatcatcaac  2460
ccgaaattca aactcagttg ccgactcaag ggaagcgaaa tgtaggttcc attctgtggg  2520
agaagcccgg gagcaatgta gcccagctac cgatctgccc cgtcacgtgc agttagcaca  2580
gggagatacg gtagtaagag cgggtattca tccatcttcc ctgctaacct gatggtcgga  2640
cgtgtggcaa gataaagggc aaggatacgc ctttggccga gagaaattcg ttcaggccgt  2700
acctgtaatc ctgtctgccg acttcggtag gctgacggat gtgttgtgat cctgaacaag  2760
atcgatatag agaggcaaaa gctggaggag gaaacggcat acccaaaacg gaggcttact  2820
gatgattcgt gagataaggt tttcttggca gctgtgctgc tggttctgct acaggtatgg  2880
gtgttcaact aatatttctg ttcaaagtag ccactccttt cgtctatata tatactctga  2940
gctgttgccg ctgaacgtgt ctgtttccgc tctcttgtgg cgagcattct aataggcatg  3000
ttcctcgatg tccttagtgg agtacccggg ctgcatgcgc atcattgacg gctacggctt  3060
tcgtccgcaa cgggctggca cgtccttctt ggaaaaggat tcggacttgg ggtattcacc  3120
gtcggcacgg aatctgaagt cggtatatat gtattcgtgc tggagcttac catcatacat  3180
catctctcct tttcattctg gactcgtgga gcctgtcgag tgtgccgtat atgcgcttcg  3240
tacaggagca agcatcctgc tgacttatct gctattgctt atttgaactc gcttttcggc  3300
aagagactca aaatgccaga aaatgagtaa acgcggaaag atcccaacga aaaacatcgt  3360
ttcctattgg tgatagccac ttctgtgtgg tattcatcta tgcgatacgc cttttctatt  3420
tgcaaatcct agtccgaact ataaggctcg tgccgatagc aatgctttct atcagaagct  3480
gtatatcctt cgcgtggcgt gatatacgac cgcaacggag agctcctctg tataacgaac  3540
cggcctatga ccttgtagcc gtgacgaaag aggtagggaa ttcgacaccc ttgccctgtg  3600
```

```
tcagaccttg aatgtggagc cggagttgta cgcaagcgtt ttcaggacat aagggatcgt    3660
cgtatcaacc ccggcattcg ccttacgtac ctcaactcct gctggcgcaa ttgaaccctc    3720
gcgagcggga cgttttcagg agcagctgtt caaattcccg ggcttttcca ttctccccgt    3780
gccatccgtc aatataagta tcatggagcc gcacatgtgc tggctatctt tccgaagcga    3840
atatgcgtga cttagagcgc gacagctcgc tattgccggc gactatgtgg gtagaagcgg    3900
tatagagcgt cagtacgaga aacgctccga ggcgaaaaag ggatagaagt cctgcttcgt    3960
gacgctcgcg tcgtatcaaa ggacactact ccgatggcaa atacgattcg ccggccatcc    4020
cggacgcgat ctgacccttt cgatcgacag caagctacag acactggcga acagctgatg    4080
cagggaaagc gcggagctat agtaatgatc gaaccgagac gggggaagtg ctctgtctcg    4140
tctcttcacc ctcctacgat ccctcctact tgccggtaag gacaggggga aaaatcatct    4200
ggagatggaa catgtcgaaa caagcccctg tatgcccgtg ccattcaggc cacctatcct    4260
cccgctccac tttcaagccg gcacaagggg ctatctttct gcaggaaggg gtatcaggcc    4320
tacggatgct tttagctgtt atcacggttt ccctcccctg acaacagacc ggcctgtcac    4380
agccacggct ctccactcag tctggtgccg cattggccac cagctgcaat gccttcttct    4440
gctggggggct ccgtgccatc tggataacag gcggttctat ccttccgttc aggaggcatt    4500
cgagcattga aaaaaacaag agccgcacac ggggcgccg acacacgcgg acacgagtcc    4560
ccccggagag acgagacgat atacccaaaa caaaaaggta caacaaacgc ataaaaggcg    4620
agagaaaacc cccacaacaa tatccacatc gagaggcaca gcgaaaaatc agacccactc    4680
cgctccaaat agccaatctg ggtgcatcat tgccaacagg ggacgctatc gccgtccgca    4740
tgtggtgaaa gccttcaggg gatcccctc gatacagctt atacgaactg gcagaatagc    4800
ggatcagtcc ggcgaatatg gagtatatag tagaaggaat ggcgagagcc gaacgggcgg    4860
aacctgtcat gcagccaact tcgccccggg ggaaatagag tatgccggca agacgggtac    4920
cggccgagaa tcctcacggt aaagaccatc ggctttcctt ggctttgccc ctgcaacaat    4980
ccgaaggtgg tcgtatccct atgtggagaa cggcg                              5015
```

(2) INFORMATION FOR SEQ ID NO:362

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 556 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular   :

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...556

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:362

```
gcaagatatc caaactttta atcgggagat tatcgctaaa ccatatgact aaaaattgag     60
aaggacgatg tgctgaacat ccttgtcagc agtagagacc ggagctttca acgccctaca    120
accaagtgtt gaccactcgt gcactggccg caacggctat ggaacgaact cgaacgaagg    180
cttcctggtc gattcgaagg gtacatcaat tatcctattt taggccagat ctatgtagag    240
ggcctactcg taccgaactg gagaaggaga tacagaagag gattatttcc agtgatttat    300
caaggatcct acggtaacgg tgcagcttca aaatttcaag gtgcggtttt gggagaggtg    360
aatcatccgg gttcgatgtc ggtaaaagga gacgaataac tcttttggaa gcgatcggaa    420
tggccggaga cctgacaatc ttggtcgccc gcgatcgggt tttgtgatt agagaaaccc    480
gatgggcatc cgaggttttc cagacggatc tcagaaaggc ccacttgctc gcaagcccct    540
gtactatctt gcattc                                                    556
```

(2) INFORMATION FOR SEQ ID NO:363

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 685 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

```
    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
         (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
         (A) NAME/KEY: misc_feature
         (B) LOCATION 1...685

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:363

gccggtttcc gtctggtaca ccatcaggag ttcggtacac gaatgacgct aaggtatcca       60
tactcgccaa gtatgggccg ctgaacttcc gcgctacgat gctaacggct ataagactcc      120
cacgctgaaa gagctttttg cacggaagaa ctcaccacta tgggttcgca caatctctat      180
ctcggcaatg cggatctaag ccacagatgt cggattatta tgctttgggc ttggagtaca      240
atcaagccct atctcgttca gtgcaacggt ttatgacaat gaacttcgca atctatctcc      300
tttatggata taccgacctc acccgagcac gaagctcagg gaacaagaaa accaagcagt      360
atgccaacat aggaaaagct cgcagccgcg gcttgatgtc ctatgtgatg cctctatcgg      420
ttggggtatc aagttaggag cggatacagc ctcgtggaag ctaagaatct ccagacggat      480
gagtggctgg aggagctgca cgtcatcgtg ccaatgtgca cgccgattgg gttcactacg      540
gggtcagtat agacttggcg tgagcctttt cggccgtatt cagagcgacg ttactacaaa      600
gacggcaatg ctccggacta taccttgtgg cgactcgcac atcgcatcgt ttcgctcatt      660
tccgccacat catcctggat ggaac                                            685


(2) INFORMATION FOR SEQ ID NO:364

        (i) SEQUENCE CHARACTERISTICS:   :
            (A) LENGTH: 401 base pairs
            (B) TYPE: nucleic acid
            (C) STRANDEDNESS: double
            (D) TOPOLOGY: circular

       (ii) MOLECULE TYPE: DNA (genomic)

      (iii) HYPOTHETICAL: NO

       (iv) ANTI-SENSE: UNKNOWN

       (vi) ORIGINAL SOURCE:
            (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

       (ix) FEATURE:
            (A) NAME/KEY: misc_feature
            (B) LOCATION 1...401

       (xi) SEQUENCE DESCRIPTION: SEQ ID NO:364

tggatttggc acgtctatgc ggcatgcaac cggctgcagc cctcatagaa ttatcaatga       60
ggacggtacc atggcacgtt tgccacagct atgggaggct ccaagcgttt tggactgaag      120
atcattgcca tcaaagatct gatagccacc gcctcaaaca agaatccatc gtagaaaagg      180
gtgtagaagt ggatatccta ccgaatacgg acacttccga ctcatacctt tccgtcaaaa      240
atccatggac tggagcacat agctttgttc aaggggacgt gggacgaaaa tgaacgatac      300
tcgttcgtat gcactcatcc tgtgccactg gcgacatatt cggtctatgc gttgtgactg      360
tggcggccaa ttactgcaag caatggagaa gacgagaaag a                         401


(2) INFORMATION FOR SEQ ID NO:365

        (i) SEQUENCE CHARACTERISTICS:
            (A) LENGTH: 529 base pairs
            (B) TYPE: nucleic acid                    •
            (C) STRANDEDNESS: double
```

```
      (D) TOPOLOGY: circular

 (ii) MOLECULE TYPE: DNA (genomic)

(iii) HYPOTHETICAL: NO

 (iv) ANTI-SENSE: UNKNOWN

 (vi) ORIGINAL SOURCE:
      (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

 (ix) FEATURE:
      (A) NAME/KEY: misc_feature
      (B) LOCATION 1...529

 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:365
```

```
gcgtgataag gctgcggtaa tactcgtgtg tggagaggtg cttggcgagg accctcttac    60
acctcttttc agcccgtact tctccatgtg ttcggcgtgg tgtcctgata cctgataagg   120
ctggcacggc tcatcacctc gtccgcaaga ggcgtggggc aggtgctttc gtcctgtacc   180
tgcgccttgc gttctctcct tcttctgctt cctgcgctcg ccctgcacta tcggcactac   240
ggtggatgga tgtgcggcgt ttcctcgtcc atgtgcagca ctgccgatac gaggtttcag   300
ctccgtaggt ctctctcagc cacgccacgc tgtcatcgca ccatctccga gcctcccttc   360
gtcttccatc cgtgccatat cctcgtgcgt tcgctcagca cgatgccgta ttgcctgcac   420
ttggttcttt ccaatcttac gttcaatccc gccgtgtcaa ggcggtggcg tatggctaac   480
gtgcggttgc cacgccgtcg ggaaacatta ttaactcacg gtttagatg             529
```

```
(2) INFORMATION FOR SEQ ID NO:366

        (i) SEQUENCE CHARACTERISTICS:
            (A) LENGTH: 1249 base pairs
            (B) TYPE: nucleic acid       :
            (C) STRANDEDNESS: double
            (D) TOPOLOGY: circular

       (ii) MOLECULE TYPE: DNA (genomic)

      (iii) HYPOTHETICAL: NO

       (iv) ANTI-SENSE: UNKNOWN

       (vi) ORIGINAL SOURCE:
            (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

       (ix) FEATURE:
            (A) NAME/KEY: misc_feature
            (B) LOCATION 1...1249

       (xi) SEQUENCE DESCRIPTION: SEQ ID NO:366
```

```
catcagagac cctccttgaa tatcgtttga tttgcacgct caccttgccg agaaggctcc    60
gaacaggtcg gctatctcac aagccgacat ccaaacagag ttgacgggat atgtacattt   120
cccttcccat ctatggttat agttcctttt tcatagttgt ttagtattca ttgttctttc   180
gtctttccat cagccttcca tatcctctga gattttcttc tccgaaatct tcgcatagtt   240
ctgcggctgg taatggaagc atgtcccatc atcttggcaa tgctttccgt acattacctt   300
ccgagattaa gaacgatccg aagctatgcc ttgcttgatg gtagacaggt tctccttgcg   360
tccgatgatg acacccagtt catgtatttc aaccacatca tatccctgct tggcaaaggg   420
aagacgggtt gtgtgtcatc ttcgtgttgt atagattgat aatctgctcg gctatcggat   480
gcaggggaat aatgattcta ctttcgtctt cctgcggtta atccgtatat aacgccgtcc   540
tcggccgtct ttcctatgtg gtgcggatat agcaattgcg tatcaacaag gcaagccccg   600
taaaacagga gaagatgaaa gtccgtcgag ccagttcttc aacgggtcgt tctgtggcaa   660
tttaagttcc aacaactgtt tcagttcgct ttgctgatgt gcatacgctt ggcaggggggc   720
ttcttctcat attcgcttct tctaatggat tggctcggat aatctcatgg tcaacggcaa   780
ggtaaccaat cggttcagcc aacaaaggca atggttggtc tgcgatgctc cgagtttttg   840
tatcgtttca gataaacctt gtattcccgt ccgaactcct cgtgatgtcc aagaaagcaa   900
tgtcgctcat gcctttgac tccaaaaact ccgaatataa atttggtaat atcttgaact   960
tctgtatgtg gagtttgagc tatttcgtta gctcttactg caagacgttc tcgctccctt  1020
```

```
tctcccatcg gagtaaatga atgggaacta cgacatgtcc cgcaatttca tttttcaaag    1080
ttccgcactg acaacaccat atctcttaag gagatcctca taaagccttc cgcatcactg    1140
cggaatttct tcagacggtt gtttgccgtg catctgggtc tctgcatttt tggcgttcca    1200
ttggtggggt tgcaggaaat gccgtgtaat gacgtgttct ttccgtcat                1249
```

(2) INFORMATION FOR SEQ ID NO:367

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 2015 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...2015

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:367

```
ttatactccg tcggatcggg atgattcagt agatattgca gatcggcacc gctcggctac      60
cagcggcacg aggataaaag ccaaagtcgg agtgcggatt tgcccgatcg tccggcctcg     120
gaagcggcat cgatgaagag gtcgatactt tgttcctgta ctcgtaccgt ccgctcgtgg     180
ctatcagtaa ggtatcgcag gcagttgctt gccggtcaga tgttccgcta cgtggagcag     240
tcgcttcgcg cttctgcacg tcgcctctcg tattcttctc cttgtggcac gaagtcggtt     300
cgaatccgtt gggcagtacc atcggatcgc gttcgagcag ttgcggcatt ctttggccgt     360
gagttcgctt accgtggcaa aggtgtccga ttgtgagccg ccgcttttttc tatcccgtgt    420
ttggcttcta caccgagttc gcagccattt gatcgccgtt gtagcccggc atgtaggcat     480
acagagcttt ttattgccgg cgatagaccg ccctgtggtg gtggcatgtg tgaggaaaag    540
gttttcagac gaggtgtttt ccgcttgctg tagaggagtc ccatgccggc atccattcgt     600
tgaatatacc tatggccggt tggtcttcgg ggcagagtat tcacacaggc tatgcatcgt     660
ttgggctgcg gcaatgccga agagcgggcc tcgtcatagt cgccgtaccc gttgtcgctt     720
tggatgccga agtgccccac atctcatagt agagcgttgc tttctgtgca tggaggggtt     780
cgaatccacc agtactacag ggggagaacc gggagttcgc cagctgccgc acaatatcgc     840
aagtccagcg agggtgctgc atcacgatgc cagtcctcca agtggcaggg actgtattct     900
caaaatcggt gggtaagtct tcctgctccg tagcaggggg cctatgaaaa tgatacgtcc     960
gtcgtggcgt ttcatcatct atgtgccctc gatgtaagca cagtgtatat accaccctgc    1020
ttattgcaac ctcccagctc gtctccagca agagggaagg gttggggcga aaatcattat    1080
tcgatcgcaa ttcgtttggg aaagtttttt ccggtcttat cctccgacaa ccgccataca    1140
aaggccacgg ctacggtcac aacgaaacct gtggcagcgg aatcaaggct gccagcagcg    1200
tccatttccg gctccccgtc tcttttatat gttaaacagg gtggtgctgc aaggattgtg    1260
gagtaggcag aacacatgag attgatacct gtcagcatag tccaaccgcc ggcttcgaac    1320
agtgtgccgt ttcggctgtg ccatcggctt cgaacatgac gccggcaccg gtcctccatc    1380
tattcccgta gtcaggacag tcagcatcag tatcgtcggt acactatttc attggccgga    1440
atggccaata cataggccag cagaatgaca cgttgagtcc catcagccaa ccgggtccgt    1500
ccagcaggtc gatcagatat cggctatccc gactccaccg atttggatgt tgcaggtgag    1560
ccagataagg caccggccgg cgcggcaaag acaacggcac gccacaaaac gacgagttac    1620
ggtctacgat ggatttatag atcgtctgcc aaaactgtgg cgggcgtagg gtggaagctc    1680
cagattgaac gtggagactt gacctcgcag cagcgccggg agagtaccca agagaagaaa    1740
aacatgaaag cgatacccag caatcaatgg ccacgactga cccaatgccg atcacgccac    1800
gcaaataggc cggacggcag gtgtgaggaa gatcgtggca aggagtatct gtgtaggcca    1860
accccgttac acagagagaa gttgttggtc agaatagcta tcagtctctc ctttggctat    1920
cgatgatgcg cgtattgatg attgctgccg cattgcagcc aagcccatcg tcatggtcag    1980
agcctgcttg ccgtgcgcac ccgaacgaca agggg                               2015
```

(2) INFORMATION FOR SEQ ID NO:368

    (i) SEQUENCE CHARACTERISTICS:

```
          (A)  LENGTH: 534 base pairs
          (B)  TYPE: nucleic acid
          (C)  STRANDEDNESS: double
          (D)  TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
          (A)  ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
          (A)  NAME/KEY: misc_feature
          (B)  LOCATION 1...534

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:368
```

```
ggcatttcaa aagcgataaa cagcccttac aatgaataaa aaagtaccca gctgtcagtc      60
tccaccgttg tgtaccgaaa aaagttgaca gttggggtag cgggattcat ataagtttac     120
acacataccg gttagtccta tgctgggtta caactgtcga ttggtatttc cccttaggtt     180
tacacaagca gatttaccct ttgctcggga ttcattcttc tgtagttgta gagttccgga     240
gcaatttccg agcctctctt tgttgtgtat ataaagagag agatttgtgt atatcggaaa     300
tatatttccg tatataagaa aatttatcgg agtatatacg aaatatattt ccgcatatgc     360
ggaaatttcg ccaccttctt ggtgcgataa aacgctgacg ctgaactact tggcatcgga     420
ggcgaggtat tcttcgagga tcgaaggcgc tccgaattgc tgagatgttt tgacattttt     480
ttcttggttt tcgcacaccc caactgcaac ttttttcagg ncacgacagg atca          534
```

```
(2) INFORMATION FOR SEQ ID NO:369

    (i)  SEQUENCE CHARACTERISTICS:
          (A)  LENGTH: 577 base pairs
          (B)  TYPE: nucleic acid
          (C)  STRANDEDNESS: double
          (D)  TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
          (A)  ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
          (A)  NAME/KEY: misc_feature
          (B)  LOCATION 1...577

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:369
```

```
ccaaacgatt ttgcttctgc accacgtaag tttcggtgct tttgtctctc attttccatt      60
gcctcctcca agagctccac acaagatata gtccgaaggg cttcttggta ttcttaaaga     120
gtgcgatcgg tcagaaaaag acgaacccaa atcagaagaa agtggttccg gaaatcctga     180
aaacacgcgc gaaaaaattt cgttttggtt cgggaacaaa aaaattctcg aaccaaaacg     240
aaaaattctc agaccacgtt ttgcggagct atactcggca aaatttacga acgaaaagcg     300
tgcaagatga gtatgccccc tctcgctgat tttgtatcgg aggggtagag agttttgtca     360
gagggcttgg ccatctaaac caaacggctt gacacagagg actgaggtcg gtggaaaatt     420
gccttacttt tgggtatagc ccgccaccgg attcggcgaa gaaaggatct gcaaatggat     480
ggtttcgcag atcgtttagc ttacgggttc gaagtcgagt tgctttctgt ccagattggt     540
tgggcaacac gttacggtga tggcatcgcc cagactg                              577
```

```
(2)  INFORMATION FOR SEQ ID NO:370
```

```
    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 435 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

   (ii) MOLECULE TYPE: DNA (genomic)

  (iii) HYPOTHETICAL: NO

   (iv) ANTI-SENSE: UNKNOWN

   (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

   (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...435

   (xi) SEQUENCE DESCRIPTION: SEQ ID NO:370
```

```
aggctttacg ccgaaacagt gtgctttctc ataggccatg acggcgatgc cacaagagcc      60
tcggccgaaa ggttgtgatt gatcagcgta tcggccagaa gagtggcccg ttcttcaggc     120
tgaccatatg catagtggca aagtgacgac gccctcttgc aggccgacag tctgcttggc     180
cacttccgcc agatagtatg cttgctgtat atgcccgtga tcatagcatc ggcatccccc     240
aagcgaccat catcataccg aaatagttgg ggtcgaacat cttgtccagc gcttggtatg     300
attgcctccg cgccgccagt tctgttcggc aaagacacgg gcaaatgatg accggcgagc     360
cttttcttc aatcggaagc cggtaattta aagaattttc gatacccctt ccaaagatta     420
aattcccaac tcttg                                                       435
```

```
(2) INFORMATION FOR SEQ ID NO:371
```

```
    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 568 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

   (ii) MOLECULE TYPE: DNA (genomic)

  (iii) HYPOTHETICAL: NO

   (iv) ANTI-SENSE: UNKNOWN

   (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

   (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...568

   (xi) SEQUENCE DESCRIPTION: SEQ ID NO:371
```

```
gtatcttttt tgtcctgata taccgtagcg atcagctgat acacgtcgtc tgacgatagg      60
gaacatcctt gatcttgtta cagatctcga gcgttctgcc aagtcattgg cctgataggc     120
acaaaccgcc gagaagaacc ctaccatata gagttggaat cctgtgcaga gatttcggga     180
acagcagcaa acatcgcagc tccttgattt gcatgaactg atcgaaggct tcgagagctt     240
tcttaagtct ttcttctcca tgtagtaacc accggcattg atatagtaaa gatgttaccc     300
ttgagagatt ccatgatctt ctttgtgaac ttgggcttta cctacccttt tgatcaggca     360
tattgtccaa ctggtcggcc ttcaaataaa acgcaaaatg cgcagcaaag catcgttcat     420
catagcacga tccggctcct gttcacagtt tgcttgagat tctctggatg taaagagtct     480
ctcttccacc gaccggccac aaaccaagtc ttggcatcgt tcatcgctcg gggttcttct     540
ggcttcaccg atccagcgta cgagctcg                                        568
```

```
(2) INFORMATION FOR SEQ ID NO:372
```

```
      (i) SEQUENCE CHARACTERISTICS:
          (A) LENGTH: 712 base pairs
          (B) TYPE: nucleic acid
          (C) STRANDEDNESS: double
          (D) TOPOLOGY: circular

     (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

     (iv) ANTI-SENSE: UNKNOWN

     (vi) ORIGINAL SOURCE:
          (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

     (ix) FEATURE:
          (A) NAME/KEY: misc_feature
          (B) LOCATION 1...712

     (xi) SEQUENCE DESCRIPTION: SEQ ID NO:372
```

```
agcaaatcag atctatttgc cgatggtaga tttcagacct ttcaaggtcg taaatcgctg      60
cgtgagctta cgcaggcacc tgccggtgcc ccggaagagt atatgaatat gtctttgtgt     120
acgaaaagaa tggcaagcga caggagtcga tatggatcat ctgcctgacg acagctggac     180
atacgtagat cggcacagaa actgattaaa aaaggctata cacctcccgt cactgacttc     240
cttttcttcg tgggggtgaa gatgttacat ccgaaatcgt caataaaaag gggatactct     300
cttgctcctt tcaccgatt gggagaatgc aagcgacgat aagtggacaa tatcagtgag     360
atgtatgatt atgctcagga acatgcttgg gattctacgg cgtatcggct tccacttcgg     420
atgatatttc cacatggcga tcaataccgg tgctgattac ccgatgcttt tcctcgatgc     480
tgttaccgtt agaccattac aacgcggcaa tccctctttg gttattttgc gggatggtga     540
atccgaggca aggttagtga tgcgaatttc cccggtgtgg gacaagccaa gcttttttcg     600
atcgttatat aggcaatgag ctttatcaac cttcttatgg ggaaggttgc ttgtattggc     660
tttgtgggtt attctccttt tgttcgatgt attcgcaagg tcgttttttg ca            712
```

```
(2) INFORMATION FOR SEQ ID NO:373

        (i) SEQUENCE CHARACTERISTICS:
            (A) LENGTH: 498 base pairs
            (B) TYPE: nucleic acid
            (C) STRANDEDNESS: double
            (D) TOPOLOGY: circular

       (ii) MOLECULE TYPE: DNA (genomic)

      (iii) HYPOTHETICAL: NO

       (iv) ANTI-SENSE: UNKNOWN

       (vi) ORIGINAL SOURCE:
            (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

       (ix) FEATURE:
            (A) NAME/KEY: misc_feature
            (B) LOCATION 1...498

       (xi) SEQUENCE DESCRIPTION: SEQ ID NO:373
```

```
gaaccgacga ggagaaagaa ccaaaaaaga atcgtttgtc ttgtcttctc ataattatat      60
caacgttgtt aggagttata caataacatc attcgccatg cggcagcagg cttgcagcgt     120
atgtatccac tggcaagcaa cgagaccgcc gtttccgttc gcaagcggct ctcaccaaga     180
gaaacgggtg caaatcggca agcaaggcgg actccacttc agacggagag aagtctcctt     240
ccggcctatt agaatcagta catcctgtcc tacgtggtag aaatccgacg gatacctcgg     300
ccttgggtta tttcggctcg aacagcttcg tccacataag cgaaagacga acagctgtct     360
tcggagtgtc ggcaattaca gtttgtatgg ggtattgact tgaatcacgg gaaaaggagg     420
ctttgagcga ctgcttcatc gactaattgc gatgcgcttc caagcgttcc gcttttgata     480
ccgcctacgc cggaatgg                                                    498
```

(2) INFORMATION FOR SEQ ID NO:374

    (i) SEQUENCE CHARACTERISTICS:
       (A) LENGTH: 1192 base pairs
       (B) TYPE: nucleic acid
       (C) STRANDEDNESS: double
       (D) TOPOLOGY: circular

   (ii) MOLECULE TYPE: DNA (genomic)

  (iii) HYPOTHETICAL: NO

   (iv) ANTI-SENSE: UNKNOWN

   (vi) ORIGINAL SOURCE:
       (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

   (ix) FEATURE:
       (A) NAME/KEY: misc_feature
       (B) LOCATION 1...1192

   (xi) SEQUENCE DESCRIPTION: SEQ ID NO:374

```
gagataaaac agggtgaaga gccagaactc tttgcgacgg gcacggccct gaagtctaca      60
tatttgcgga gacaaagtat gaaccaacgc atagctgaaa ggataagaag ggggagagag     120
ttatttcacc ggcaaaaata tatcttttgg cgggtagata aaagctgtga atataaatct     180
catataacgg tggccgggat tgaccacaaa aaagcctgtt catgctttgc cgataggcca     240
tacatgatag gcttttgtct ttacagtctc tttgtggcga gactctgatt atcgtctata     300
gagacctttg aaaaataagg aggtggaggg aaaaggtggc agtaggagtg aaagtagttg     360
taaatccccc ttgcggagct acttgcacga gccctcaagg gtggttatgc cttatcctac     420
ggatgaggac ataattatcc cggcgttctg cataaattaa agaagacctt tgcacggcaa     480
ttggcgtgca aggtctctta tatctgtaca gacactgaaa atcagtcaat tgacaatgaa     540
tctccggaaa atgccgtgcg acagtctcat ctatcggttt acagctcgac ggacctccaa     600
ctcccngaac ctgccatccg gcagagagca gatagcactt ccatcaatag accatagtat     660
cctctcatat gagaccatag tatccttcat gtgagaccat agtatcctct catatgagac     720
catagtatcc tctcagtgag accatagtat cctctcatat gagaccatag tatcctctca     780
tgtggactat agtatcctct cataggagac catagtatcc tctcatttga gacatagtat     840
cctctcatat gagaccatag tatcctctca tgtgagatca tatatcctct cgtggaagtt     900
cattctttgt atctcaagga aagatcaatg ataggtgtat ggctgccaag tgaatagaga     960
gcagtgcccg aatacgttgc aatcgataag catatcgact tggttcgaaa atacattccg    1020
tgctttcctt atcgattcgc tgacatgacg tccctgaacg aaacctcttc gtcggatgtt    1080
ttccttgtcg tgccatcgtt ttgtgtcatt gatcatacca taaacaccaa aacaatcggc    1140
cgacacacaa taaaatgaat ggataaatgg ataaaggcct gcttattgtg ca            1192
```

(2) INFORMATION FOR SEQ ID NO:375

    (i) SEQUENCE CHARACTERISTICS:
       (A) LENGTH: 3446 base pairs
       (B) TYPE: nucleic acid
       (C) STRANDEDNESS: double
       (D) TOPOLOGY: circular

   (ii) MOLECULE TYPE: DNA (genomic)

  (iii) HYPOTHETICAL: NO

   (iv) ANTI-SENSE: UNKNOWN

   (vi) ORIGINAL SOURCE:
       (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

   (ix) FEATURE:
       (A) NAME/KEY: misc_feature
       (B) LOCATION 1...3446

   (xi) SEQUENCE DESCRIPTION: SEQ ID NO:375

```
gccttccgaa gagcaaatgc catgccaaac aatcccctgc cctcattata gtcacttatt      60
cgattggccg aagtgtccac tgtccgtttt cggacagtcg ggtgttcgtt tccgaacagt     120
cggacacttc gccatcggag aaaacttcat attatcagcc ttttaagggt agcggcataa     180
actttgctgt cggaaagtgc aataaaaacg aaagaaagat gaagaaaaaa agccttttcc     240
tcctcccctc tgcttcgcct ccctgggtcc gactccatgg agcgaggttt cggccagcag     300
gttgccgccg cggatccatc ccctttgtcc ctcacggaag ccaccggttg gcacgaaagc     360
agagcgtgga tgcagccgtg gcactgcaag agttcgagcg gcctactggc agtggcgcac     420
ctatcgggca gaattgctgc cggagtgaac ttgacagcca cactgccgga ctacaggcgt     480
gcctattcgc ctatcagcag ccggacggct cttacagctt cgtccgctcc aatgctctgg     540
cctgtcagga catatatccg tggatcagaa tatatggctt acgggtggaa gctctctttg     600
gtgagttcgc tcgagcatat caatccgctc ggcacggagg agctgacagg catttcatga     660
gcgtaccgat cagcctgacc ctgagcaacc gctcttcgga ctgaacgaaa tgaaatggag     720
tcgccgcata gaaccgtgcg ttacgaagag gctcgccggc gattcgtcgc caatacggag     780
gagggagcgt aagctgtata gatcattact tttcggccct gctgcgcacgg gaaagtacaa     840
caatgcggag accaacctcc gtaacacggc gaagctggtc gagtggcgcg tgccaaaaag     900
aagatcggga agttgtccga aaacgaattg cagccgtgga gatcagctac gcttcggctt     960
cttcggcaat tctttcgagc gtacagccct gcgcggagcg gagatgtccc tgagcatttt    1020
cctcggtttc agccggatga agtcctctcc ctctctatac cggccgatac gatcttcaac    1080
ccgtgagcta tgaacgggtg atggagttgg ccggacgcaa tcatccgtcg tcggagagat    1140
gaagcgcagg atgctcgaag ccgatcgttc tctggccgag ccaaatccga acgcttctcc    1200
atcgaactga tggcccaaat cggattgccg gacaggcgga caatctgcac gatgcatacg    1260
gcggacgtct gaagacaaca gctctgtctc cgtaggcgtg cgcattcctc tcgtggattg    1320
gggcgcggac gcggtcggat acgcttggcc gagagcaacc gccgtctcga aggcatcgac    1380
tgcgacagga agaagagcgt tggcaccggc agatattcct gtggtggaga aacacaacaa    1440
ccaacttcgc atcctcgaat tggcacgtcg accgacagta tcgctcaggc gcgctatcat    1500
actgccgtgg aaaccttcac gtcggggcta tttccaccct cgatctgaat gcggcacagg    1560
atgccaagac ctggcgcgta cctcgctcgt cagagcattg catcactatt ggagctatac    1620
tacaatctgc gtagcctgac ggctatgatc cggtacgcga tgaggaatcg atatacccat    1680
ggaagaacta tagggacaaa ggaatcggac gatcaagcaa tgggaggaaa ccgactgata    1740
cccgattgac ctgaaaaggt atatctggca aaccggagaa ttcttctatt ttgcgcatgt    1800
ttttgcgcga agtggttaga aatctttccg gccgaggcaa aatgctaagt attattggac    1860
aaaaactcta accattatgt actggacatt agaattagcc tccaaattgg agatgctcct    1920
tggcctgcaa ccaaagatga gttgatagac tatgcacaac ttcgggtgct cctcttgaag    1980
tcatcgagaa tctgcaggaa atggaagata aggggaaatc tacgaatcga tagaagatat    2040
ttggccggat tatccgagaa agaggatttt ttcttcaacg aagaagagta ctgataatgt    2100
aatctcctaa gcgaatatgc cccggatgtg caataatagc actcggggct tcgtttacca    2160
ccgtggcatc agtcttgcat aaatctttcc gttcgctcat tttgccctgc tcctgaccgt    2220
ggccggggga gaggatattt tcgctcaggc cgattattgc tggctcagta cacccgtgca    2280
tacggctact acaatccggc ttagccggta tgcgcaaaga gattttcatt actgcgctgc    2340
acaatagaca atggaaggca tgccccgaag tcctaagagt ttcgtcgtac tggccgatgc    2400
gctattcgct tcttcgacag agagcatgga gtgggagttc gggtagtgac gaaacgagag    2460
gactctttgc catcaatgag ctgatggggc aatatgcctc aaacagaaac tcttcggcgg    2520
agatctgtcc gtcgccctcc aagccggatc gtcaatacgg ctttcgatgg caccaaggtg    2580
gagctcgaga cggagaagat ccggccatcc cccttaccaa agtgagcgga aaggccttcg    2640
acatcgtgca ggtatatact accgccgcaa agaattgtac gtcggattca gctctcccat    2700
ctgaccgctc cggcaattcc gctcaatgaa cagtacatat tagactgaca aggcattatt    2760
atctccttgc cggatacaat atccgctcca ttttcgtta tttgcatggc atccttctat    2820
ctttgcagct actgacgggc acgttctcgt ttggacgtga cgatgggaat gtcatacaac    2880
aaccgcttct tgcctcactg atgtatcgtc ccacacaagc cgtgggagtg agcttggga    2940
gcagttgggc aagttctatg ccggctatgc tttcgagtgg ccgacatcgt actggctaaa    3000
gcctcatggg gaagccacga attgctggtc agctattctt cccattgagc aatacgaaga    3060
atagagatgc aaagtataaa agcattcttt cctctgaaaa ctgccttagc gcaggattcg    3120
gggagagcag cgaagcgata tataaataat gtatgtgtag aaagaacagg tttttcgctc    3180
ttgcagcttt tttctgtttg gagttttcac tatttcgtcg tgcggctctt ccaacgggct    3240
gttggcggtg aactgacccg gtgccaagct atcttcatgg aatagccatc gcctttcggg    3300
atgatacagg ttccccgagg gaagtattgg tgttgggcaa ccaaagaagc agacagctta    3360
tggggcatac cttgccgaat ccgccctata tctggtggat gcctttttgg atggatcgga    3420
ccggagatca caatgcccaa taccgg                                         3446
```

(2) INFORMATION FOR SEQ ID NO:376

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 557 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

(ii) MOLECULE TYPE: DNA (genomic)

(iii) HYPOTHETICAL: NO

(iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
    (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...557

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:376

```
tgcgatatga agtcatgctg atagagtacc gaggccgaag cgaggagcaa aagaagcaat      60
agaatataaa tatggtaccc cagctcactc tggaaacaca gaccgatctc ctccgtcagg     120
cttcacatca taggatccgt ccaatactgc tgaacggcaa gaactccctc ggacaaacct     180
tcggcatagt tccccgtcga aaatgaggga tcatgcgatc atgtatgata cggctcagca     240
gaccacgggc aagtaacctt ccaaacccat agcccgtctc aaagcgtacc cgccctgatc     300
cagcacgagt acgagcagga ggccgttgtt gttcttttca ttacgactcc ccattgacgt     360
gccagcttca aggtaaaatc ctccaatgga gctcaccgat agacggaaga gtaacgacgg     420
cnaactcaac ggcatgactg cgcggatggc tcgcagccgt ccgttcatca cctcctcctg     480
tgcattgctg gcaagcctgc ttcgtccgtc acgagtcgag tgctatcggc aagttggact     540
taggtacatc ttccggc                                                     557
```

(2) INFORMATION FOR SEQ ID NO:377

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 881 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...881

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:377

```
ttacagctca tggtacattc ggtagtgcat tcagtgctcc cgatgctttc aaaaagcagg      60
ccaatacgta ggcccgttcg ggcacggacc ataggcaacc tgacctgaaa cccgaaaagt     120
ccatgacctg ggacttcggt atcggatcag caatgcacgc tgcgggatcc aagccgacgt     180
aaccttaacc tatttcacac cgaccacaaa gatctgatct tgtccagccc tgactatgct     240
aataaatcac cacatacatc aatgccgaca aggctcgtat gagcggtatc gaggcctttt     300
gtcttatgac ttcggcagcc tctttgccaa caagttctct ctcgcgcatt tgcgaatgcc     360
acgatcatgc tcaattccga gatgaagaaa agcagaccga tgccccttgg agcgaaatgt     420
actacgttcg caagcagaac acaccttcgg tatcgaatat cgtggcaaag aaggacttga     480
agtgatgctc acggtcgctt catgggacgc aggatcgagc aaaactggta tgcttactac     540
ccgaagttcg ccccgaactc cagcaactgc ttgcagcaga agagcctgat tggctgctca     600
gggactgctc cgtcatccgc aagcaatggt gttcaatcct ctgcttacta ccacatgaac     660
aagtatctca ccttcggtgt gaacttaaca acatcttgga tgagctttat acggagaaag     720
acggctacca catgccggac gtaacatcat gggtaaggtt atggtcaact tctaattctc     780
tttccgagag cagatataaa agggagccgg tctccctgca taatcctcac agacaaagcg     840
gatattcctc tcataccgag aagcgggtat ccgctttctg a                         881
```

(2) INFORMATION FOR SEQ ID NO:378

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 2747 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...2747

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:378

```
ccgtaggtac cgacggattt gccgacaagt atcctctgga gatgtactgc ttcgccccgc    60
acaggtggac tctgacattg cacccgatca tgaaaagcca atgctcacgg ccccgtatcg   120
gaggaggtga agaaggcttt gatggaaaat acaaacaccc catccatcgc gagctggaag   180
agacggcgaa gaaagtggag gacacggcgg catggattac atcatggatt accgtctcat   240
ctattcctcc gcaatggcct gcccctcgat atggatgtgt acgatctggc cgaaggtgtt   300
gtctggcgga gctaagccgc atctccatcg aaaacggctc tgccctgtag ccatccccga   360
tttcacacgt ggcaattggg ataaagtaaa ggctatcgac acgcaatggc agagtaaaga   420
caatcggagt atgaggaatt tctattgaca cttgcggcaa cttttgactgc cgcaagtgtc   480
gttttcggtg agaggcacag gtcacagagt cggggcttcc atattggaag gatattcgtc   540
ggtaagcgta aacaaagaac cggcgcgttc gtcctttatg acctatgcga ccgaagcgaa   600
gctctcaccg gcaagtatga aagagttcg tactacctct tctgaacggc acgtggcgat   660
tcttttatgc cgagagcgag gcacattgcc tgccggcata acggatagct cggcaaatac   720
aaagggatgg cacgaatcca agtccccggc aactgggaga tacaagggca cggtgtggcc   780
atcttaccaa tcacggatac gagtttcagc ctcgcaatcc gcagccgccc aaatgccgga   840
agccaacccc gtaggtgtgt atcggcgcga gatagaagta ccacggactg gatggagcgc   900
gatatctacc tccatatagc cggagccaag tcggactcta tgtctatatc aacggacacg   960
aagcgggcta cagcgaagac ccaagaatcc ggccgaattc ctcatcaatc cctatgtcca  1020
tgccggaaaa acacgctcac gctcaaggtc tatcgttgga gtaccggctc gtatctggat  1080
gtcaggactt ctggcgcatc agtgggatcg aacgcgatgt attcctcttg cacaacccaa  1140
ggcggcagtg aaggatttca gcatcaaatc cacactgatg atagctaccg caatggtata  1200
ttctccctga aagccgactt acgcaccgcc gtggcgaagc ctccgagcta tctctgacat  1260
acgaattgct cgatccgaag gaaagaccat cgccaccgaa acccgttcga ccctcatagc  1320
tgcggcggag agcgtaccct ctctttcgaa gcacagccgg gtacggtaca taatggacgt  1380
cggagcatcc ctatctctat aagctcttga tgacggtacg aagaaaggga aagtcacccg  1440
aggtaatacc gtcccgtgtg ggtttccgca ggatcgaaat caaaccgata gaggaaaaag  1500
ctgccaacgg tatgccctag tatgcttctt tgtcaatgga cagcccatca agctgaaagg  1560
ggtgaatagc acgaacataa tcccgccacc ggtcattacg tgccggaaga gctgatggtc  1620
gggatttgga gctgatgaag cagcacaatc tgaatgccgt ccggctgcac actacccgca  1680
agatcgccgt ttctacgagc tatgcgacga atacgactct acgtgtacga cgaggccaat  1740
atcgaaagtc acggcatgta ctacacctgc gccgtggggg taccttgggc aataatccgg  1800
agtggctgaa gcccatatgg atcgtatagc gaatatgttc gaacgcaaca aaaaccatcc  1860
gtcgttacga tctggtcgct cggcaatgaa gcaggcaacg ggtacaactt catcaggcct  1920
atctttggct gaaagaggcc gatcgcgatc tgatggcgcg ccggtgaact acgaacgtgc  1980
ccaatgggag tggaatacgg atatgtatga ccccaatatc ccgatgcgaa atggttggaa  2040
ggtatcggac gggccggtgc gaccgccctg tgatcccttc ggaatacgct cacgccatgg  2100
gcaattcacc ggcaacctat gggggcagtg gcaggctatc tacaagtacc ccaaccgcaa  2160
ggcggcttca tctgggactg ggtggatcag ggtatcctcc gtacaacgat aaaggaaagt  2220
cctattgggc ttatggagga gacttcggag tggagcaccg agtgacggca acttcctttg  2280
caacggactg gtcaatcccg acccacgcct caccctgcca tgcaggaggt gaagtatgtg  2340
catcaaaacg tcgcttcgaa gcagtggatg ccgccaaggg acatttccgt atcacgaatc  2400
gttctacttc accaacctca agaaataccg cctgcgctat acggtttcgg taatggcaaa  2460
gcattgcaaa gcaaggtcat cggcttagat atcgatccta gacttcatcg gacattattg  2520
tacccgtaga cgggctgagg ccgactgcgg tatggaatac ttcgttgact tcagcgtaca  2580
gactctacag gcagagcgct gattcctata gggtatgaga ttgctcacga tcaattccga  2640
cttccgtcga tgcagagaga actgcctacc gtgctacagg ccctacattg cacacagtac  2700
```

ggaaggagat gaattgaagg tcgtttcgtc gaaagtcgat ttcgttt   2747

(2) INFORMATION FOR SEQ ID NO:379

    (i) SEQUENCE CHARACTERISTICS:
       (A) LENGTH: 450 base pairs
       (B) TYPE: nucleic acid
       (C) STRANDEDNESS: double
       (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
       (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
       (A) NAME/KEY: misc_feature
       (B) LOCATION 1...450

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:379

```
ttcttcttct ttttttattg ccgctgttgc tgggatggtt ggcagactat ttttaggaga      60
tcctctttct cttccgcatc ctatagtcgg cttcggtcca tgattgcatt cggagagaaa     120
agattgaata aaggaaacta ccgcaagtga aaggcgcctt catgtcggtg ttctatatcg     180
ttgccgtttt tcttttaccc tattgatcct cttgggactt gtttttgtct gtgtttatac     240
catttgctgg acgatttttt ccggattgct gttgcatttg ctgtggcttc tcttttttgg     300
ctatcggcat tttcttctgt ttggcaggta ctacccttat tcggaaagta cgtatggtat     360
ttcgaaagca agtccgaatc gttccgcttt gaagaaaggg ccgccaaacc agggttgacc     420
gccgaaatcg gtaagggccg cgaataccgg                                     450
```

(2) INFORMATION FOR SEQ ID NO:380

    (i) SEQUENCE CHARACTERISTICS:
       (A) LENGTH: 519 base pairs
       (B) TYPE: nucleic acid
       (C) STRANDEDNESS: double
       (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
       (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
       (A) NAME/KEY: misc_feature
       (B) LOCATION 1...519

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:380

```
gaaattgtca tagacagggc ctcccctcgg gataatcaca gggtggctgc atagttccaa      60
caaataagtt ctgccgtatg gagatcgaat acgagctgac cctgtcgtta gcgatatgaa     120
gatgattccc ttccgtcgtt acttgcacgt gggcatccgc tcaggcagga gggaagcaaa     180
accctctctt tgtgcagtgt aaactgttcg gatgctaccg tgtatccctt atcggaccaa     240
gtggtgcttc acgaaggaag agttcgaaat cgatatggaa gtcgcgagtc gaatcattgg     300
aatatcggcg acgggtatcc tcaatgtagc tttttctcct gccgcaattt gggcagatcc     360
acttctccgc tttcgatcac acagccgtcg gaaggagctt aaaacgaaga ccgaatcgat     420
tcaaatccgt aaaggagtag gattgtgcag agtgagcaag tttgctttta ctgtccgtat     480
gcatcgaatt cacgtactgg atacactttt cttcacttc                           519
```

(2) INFORMATION FOR SEQ ID NO:381

    (i) SEQUENCE CHARACTERISTICS:
       (A) LENGTH: 391 base pairs
       (B) TYPE: nucleic acid
       (C) STRANDEDNESS: double
       (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
       (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
       (A) NAME/KEY: misc_feature
       (B) LOCATION 1...391

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:381

```
agtgttgtgt tatgggaagg gtgttgtttt atttatcatc ggaatcgnaa cagactattc      60
ggctacttgg atttctcttt tttatccctg atgccatatt tacccttttt aggccgaata     120
tccccttcaa ggctattgag gtagtgaagt catcgaaaat ttttagaagc cttctgagct     180
atgtttttta agccactaat ttactgatac cgccattttg tcagtttaga ggatccatct     240
ttatccgtta catttgtgat tgccaaatga atgtaaaatt acacttcaca acacactttc     300
gatttacatt cttaatccga tcagggtgta atcatattta atcgaattga atccacatat     360
gtaatcatgt caatttnacg cctgaaaacg a                                    391
```

(2) INFORMATION FOR SEQ ID NO:382

    (i) SEQUENCE CHARACTERISTICS:
       (A) LENGTH: 3290 base pairs
       (B) TYPE: nucleic acid
       (C) STRANDEDNESS: double
       (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
       (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
       (A) NAME/KEY: misc_feature
       (B) LOCATION 1...3290

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:382

```
acggctccga taccggcttc atgcagacgg gcatattctt ccgtggtcag ggctgaactt      60
cgagcgagag ttgggagaag agtggacgca gtcgccgctc attttctcat agtagcttgc     120
cggagtggct ttctcggact ctcccgaacg agaaggaggt gtttgtatcc gagccgaagg     180
atcgcttccg cttcccatcc acctcttcgg cagtgagtcg gcggcgatgg attttgttcg     240
accgatgaat ccgcagtata cacaggcatt gctacagata ttcgacaggt agaggggata     300
tagagctgca tcgtgtggcc gaatcgctct accgtcaggg catcgcctgc cgggccatct     360
gctccagata agggatggct tgcaggcgaa atagcgtgat aaagtcttgg atggtgcggc     420
gtcggtatgc caacgaacgc tcacatcggc agccgtagca tcggccaaga ggttacccac     480
tcgctcccaa tataggggga ggcgtgcaag tgatcataga aagtcatatt ccggaagaat     540
atttcagatt gaggaaagag gtaaacggcg agctggcttc ggcttcgggc ggacgctgcc     600
gaacttggct tcgaaagcca ttcggccggc ttccacgcaa ggcggaaagc cgtcgccatg     660
```

```
cttacgggat cttccgccac ggctatgccg tattcaccag aacggcatca gcccccatct    720
ccatggcttc tgccgttggc tgggcgcacc gatacctgca tcaatgacga ccggcacacg    780
actcgttcga tgatgatacg gatcatttca cgggtcttca gtccgcgatt gctccgatgg    840
gagcacccag tggcatcacc gtggctgcgc cggcttcttc caatgcttgc acagcacagg    900
atcggcctga acgtaaggga gcacgataaa gcacgacgaa ccaactcctc cgtggcacga    960
agcgtctcga tagggtcggg agcaaatagc ggggatccgg atgtacttcc aacttgagcc   1020
agttggtttg agggcttccc gtgcaagctc ggccgccaga atggcttctt tggcagaggg   1080
acacccgaag tattgggcag gagagtgatt tccggatggc gggtgatcga ctgatcatgt   1140
cgtcttcttc gacgcgaccg atttccactc gtttcaggca acggtcacca tacgagattg   1200
cgatgccaag accgcagcct ccatcggtcg gaggaagcaa acttacctgt gccgacgaat   1260
aggcgcgatt caaagttttg ccggcaattt gtaacgtttc cattagattt tttcctgttt   1320
atcaaagatg atcgttcgat acggaaggga gatcatccga ttagttcttt ttattttcct   1380
gataaggctg ccgctcacgg caatacctcc tatgccacag tgcgaatgag gggaatgtct   1440
gcatcctcta tcccaccgat ggcaaaggcc gcagtcggat gccttcggct tgcatacagg   1500
cggcgatggc tttgtagcct cgagtccgag gacgggagct aaacgctgct tcgtctccgt   1560
atagcgatcg ggcctatacc cacgtagtcg gctccttcgg catatgctcg gcgcacacct   1620
ccatcgtatt gcatgtgcgt cctatgatct tattcgaacc gaggatcgac gcgcttcgac   1680
tatcgccata tcctctttgc ccaagtgtac gccgtagcat ccacctgacg ggctatttcg   1740
acacggtcat tgacgacaaa aagtctccgt ggtgacggca gacagccttg acggcacaag   1800
ccgtgtgaag cattcttcgt ccgaagcctc cttcatccga agctgtaccc agcgcacacc   1860
taacggcaga cggcctccgc ttcttcgagt tcggacaggt cgggctgacg ggcgtgatga   1920
actgcaaatc tatttcgctc atcagcctga cgaccggatc accggcaggt ctttgtgcat   1980
agcgagcaac cccgaagcac gctcacgtat cgactgacat ataactgtgc catcccggca   2040
gccgtaaaag gttcttgccc aaggccaaag cagctgcaaa agcggtgctg tgggcacaac   2100
ccgtgcctgc ttccccgtac cgccgcgtaa gagtcggaga gcttcgcatc gaccgtgtaa   2160
acgatccgat ccgttacgac cgattctccg gcatgccccc ccttgggacg aggccgacac   2220
cgctccttcg atagaagtct aacagggtct catctccggt tcgcagccca aaaggtggcg   2280
agcttcggga agattcggcg tgagaagtct atccgggaca aagccgttat atcttcaaga   2340
ttgaaacgat cccttgtccc gcggagctgt cggccgaagc tctgagtacg ggatcccata   2400
catccgaatc gaggggaaaa ccttttttcaa acaatccact acgagagaga ggtgtccgag   2460
tcgcggatca ggccgatctt ggcgacggca ggctccatcc ggccgacaaa gattcgatct   2520
gccggatgat gtccgccgaa tccacccacg ctcccccccga tagctgccac tcccctgaaa   2580
ggtaatagcc gtagccaggt ataagcccgc acgcccatgt tttcggccgt ccgcacatct   2640
gccgtatgcc ggctccggcc gacggatcca ctcctccgac acagataaca gccgggtaca   2700
caattcctgc caacgcatca gttcccggcc ttcgaccaac cacaatagcc gagtgcagct   2760
gccgaggcaa agcctgctct acgaagctgt ggcgacgatc gggcgtaatg ccgcccagtg   2820
ccaccacggg cagatggagt cgtgcagacg atcgcccaaa gaatcggggg aaaatcgtcc   2880
tgcatagccc acttgcacag actgtcgaac acggggctta agaaacagta gtcgagtcga   2940
aggggaagga ctctatatcc tctatcgcgt ggcacgaagc tgacaccgtc aaccatcagg   3000
gagctgtggc cgatcggtca tgcctttcca gacccgttgg gcagatgcaa accgcacagt   3060
ccgtagcggc cgacgagccg gggatggcgt gcaccacgat tctccggcga tagcaagctg   3120
ccacagcttc gataactgcg aatagtcctc ttcgccggca ctgggcaaac gaagatgcag   3180
ccgctcaagc cccggtcgaa aaagtggtcg agcaggccga tttgctcgct cgtagccttt   3240
cgggagtgat cagccacggt ttcatttgga gactgcctct ttctttagca              3290
```

(2) INFORMATION FOR SEQ ID NO:383

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 655 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

   (ii) MOLECULE TYPE: DNA (genomic)

  (iii) HYPOTHETICAL: NO

   (iv) ANTI-SENSE: UNKNOWN

   (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

   (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...655

   (xi) SEQUENCE DESCRIPTION: SEQ ID NO:383

```
aaggacaagc agttggaatt ggacaaacgc tatctgcgca tggcgcgcat tgggcggaga      60
attcctactg cgaacggcgc aaagtggtg ctcttatctc aaagagcaga tgatcatttc      120
cgatgggtac aatggtacac cggctggttt gagaatatct gcgaagacga gaacaacgtc      180
accaagccct atgtctgcat gccgaagcca atgctatcac caaagtggcc ggcagcacga      240
acaacgctcc ggtgctacta tctatatcac ggcagctccc tgtatcgagt gtgcaagctc      300
atcatccaga gcaaaataaa acgggtggtt tattccgaga aattcgtctg gacgaaggtt      360
gtcgcttgct ggagcgagcg ggcattgtcg tcactttata gacatttccg atattcagga      420
ataagttttt tatgaaacgt tatccggttc cggcagcacc ctctcataca tccttatcgc      480
tgccatcttc gcgccgttgg tgctcttgcc tcacatttct atttcactca caagaatcca      540
gcgatctgaa tgaagtgttg aatctgatcg acaggaaact atgtcgatcg gtagatgtgc      600
cggaagttgc agcacaatat gattccctat ctgctgggca gctcgaccct cactt          655
```

(2) INFORMATION FOR SEQ ID NO:384

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 343 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...343

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:384

```
aaagcatctc ggcatccgtg tcctgaatat ggaagtcccc atacgggccc tcatcatcac      60
cttatctccg ggttttagcg agaaaatata tgaggaggaa taccgggctt gataccggcc      120
ttccacttat tggcagctct gtcgaatgag gagtcgcgat acgaacgttg agcgtaatga      180
tgttgccttc agccggtagt tggccattga ataggcacga acggtctctt cttcgttctt      240
acaagcaatg accacgcatc catcttgtcc caagtcgcca cggaagcgat cctgatatcc      300
gaagtccggc atagcggatg tngtatttcg gtatcctnga tct                       343
```

(2) INFORMATION FOR SEQ ID NO:385

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 1107 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...1107

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:385 .

```
tttcgntccg cttttccaag attttgcatg aaatgagagn caggacgtaa gatgaaaaag      60
ctgtctttcg gatcggagaa agcagagcat gccattcggt tattttttc gcgcgaaaaa      120
agttttcaac aacgaagacg agtttggatg attctaaata aggggtaaa aagaagcgga       180
ttttgaagtc tgaaagtcag agacgagctt tttcagttca aaacatgctt ttcagaagag      240
aggatacgat ctgtatataa accgttttcg atctatatat agatcgtttt cgtttatata      300
taaatcgttt tccatttata tatagatcgg aagtcttttc tattaaatca gaggctgaaa      360
aaggccactt cgagaggcta taaaagagg caccacacga ttcgtggccg aaccatgcgg       420
gtgccttatg cctttagggg atataagagg ggttattcct acttattcgt cataggggata     480
tgggctgttt tccgagtatc gagatggcat gataggctat gggcgcgaaa gaatcggccg      540
aaagatcggg ggtataatgg tgttcagtgt gtacatattc aattattgtg agtctattat      600
ccatgtattt ctattcaagc aatcggctct cttggcacaa cattcaactt ccgacagaga      660
gcttcatccg gttggcaaag gtaacgaaat gctgaagtcg aatgaatcgt aacagccacc      720
gaatgtttta ctataaacat ttcatcggca agggtttatc tttgtggcgg aatgaacggt      780
gacttcggat atatatcatg gctgcaagag cagatctgct gcatgtggca gcatttgtcg      840
tgctgtggag gctatcggcg cacgggtagt ccaattcgtg cgagggcttg atacatacga      900
tccttgtgtg tggctatcgg tagcctacaa agagccaaat ctctgttgat aaaggctctg      960
atgcctatgg cccggacgta ccgattatgc tcggtattcg cagagaggat acacctgtag     1020
ggcgcatcga ctcgtagctt tcgatctgga ttcgacgctt gtgcgcacgg agatcatgat     1080
gaattggcca ccgcacacgg atgcctc                                         1107
```


(2) INFORMATION FOR SEQ ID NO:386

      (i) SEQUENCE CHARACTERISTICS:
          (A) LENGTH: 1296 base pairs
          (B) TYPE: nucleic acid
          (C) STRANDEDNESS: double
          (D) TOPOLOGY: circular

     (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

     (iv) ANTI-SENSE: UNKNOWN

     (vi) ORIGINAL SOURCE:
          (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

     (ix) FEATURE:
          (A) NAME/KEY: misc_feature
          (B) LOCATION 1...1296

     (xi) SEQUENCE DESCRIPTION: SEQ ID NO:386

```
cgcccaanat gaaatccggt gaataacctc acggcatccg cagaagatgg acctataccg      60
cttcatggaa cgctgtacct tcagccgaac gctacaacat ttcgctcgct tcaagcgtac      120
agctgccgct gacggcgcat tctttgtacc gacgaaaact tcgatggaat aaagactcct      180
accggagaac tgacagctgg acgatagaaa atccgtctac ctatacgtac gatgaggttt      240
acctggcgat ctggtacaag ccggctggaa agggactaac tatgctccct acacgactat     300
atctgcttgg atgcatggca gtacattttc aatcacaccg atgaggcctg atctcaccgg      360
agttggatct ttccaaagat ggcgggaaga taacttgagt gtgaagctct atgctacgaa      420
atacgtcggc gacgatggcc aggcaatcag gtggaaggct atacgcgagc agcgatcgcc      480
ctcttccaat cgacgagact gtcggagact atgtgcagtc agagctgctg tatctgaata     540
atcggacgga ctggtcgatc agtggaaggt attcaacgtt tctttgacaa gggaacggag     600
cgttcggtaa tcggcatata tgccgtatat gcaccggaaa tctctatgtc gatgatctca     660
agatcactca aaagtataag gccggcaaag cctgccggat cctttcctct tcaagagata     720
tttggaaagc gaatcatcga tgtaaatgtg cccgagcgag tattcaagaa tgaaatgttc      780
catcggtggc tgccgtgaag catggaggcc aaggagtaca atatcaaggt tacaaacgac     840
tcctttcagt ccgctccaat ctttcggagt ctgtccttct ccacgaatct gactccctcg      900
gtaagcatgg ccaaggctat ggtacaggtt acggagataa tatccatatc gacaatgttc      960
atggcgaggc tgtaagtatt atgatttcag tggtcgtttg gtttatagcg attactcggg     1020
caacgggtca ttgttgtcaa cttaggccag ggcggaacgt tcatcgtcaa agtgggtatc     1080
gctctatgaa gctgacttac taagctattt ctcacccttt cctaaaggta taccggggggg    1140
gtgtgccgga agtgtgaagt gagcacttcg gcacaccttt ttattatact ctacgagctt     1200
ttcaagcgag ggaaataaag cgtttctggg tattcatcag gcccaaagtc ttaaatttgg      1260
taccgcttan tccccgaaaa ttatgaagaa gaaatg                               1296
```

(2) INFORMATION FOR SEQ ID NO:387

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 946 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

   (ii) MOLECULE TYPE: DNA (genomic)

  (iii) HYPOTHETICAL: NO

   (iv) ANTI-SENSE: UNKNOWN

   (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

   (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...946

   (xi) SEQUENCE DESCRIPTION: SEQ ID NO:387

```
tggccctgca tcctcgnggg gtttgtactc tggtttgtat cggcgagtcg actgtggcac    60
aaaacgcctc cgaaacgacg gtatcgtacg atacggatcc gccgtactct ccgaagccga   120
tgtgcttcgg atcgctctta gtgagaagcc acagtgaaag tggccgatat ggatgtgcgc   180
aaacaggaat atgcactagg gcagcacgtg ccgatctctt cccgaaagta gacctcaatg   240
gcgttacagc catacgctaa agaagcaggt cttatatata gatatgcccg gtttagcagt   300
agcgaaggta tcgaaatggg gcgtacacac aatacgcaag gagggtgaac gtctccatgc   360
cattggtgtc ggcacagctt tggaaaagca ttccatgacc ggagaacagc tcgatctggc   420
tctggagaaa gctcgcagct ccgaatcgat ttggtggcag aggtgaagaa ggcttacctc   480
agtgtattgt ggccgaggac tcttatggcg tattcaagcg cagctatgac aatgctctgc   540
caattataag aacatatccg acaagttcga tcgtggactt gtggccgata tgataagatt   600
cgagccaatg tacaggtacg caacatcgag cctaaccctt gcaagcgcag aactccgtag   660
cccttgctct ctggcagctc aaggtctgat gagcatggaa gtggaaactc cgatcagact   720
ctccggttca ttgtcgacta taaagaacaa gtctataccg gctattttgc cgccgatacg   780
cttattccaa caactcctcc ctgcgtcagc tcgatataca gcgtcgtctg gcttcagtgc   840
agacaagctg aacaagtaca gcttcctgcc tacactcaat ctggagggca gtacacctat   900
tcgctcaaca gcaacgacat caaatctggg cagggacacg ctgacg               946
```

(2) INFORMATION FOR SEQ ID NO:388

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 501 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

   (ii) MOLECULE TYPE: DNA (genomic)

  (iii) HYPOTHETICAL: NO

   (iv) ANTI-SENSE: UNKNOWN

   (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

   (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...501

   (xi) SEQUENCE DESCRIPTION: SEQ ID NO:388

```
gtgtattctt tggattaggc gcataccttg tatatatgtc caaagcttaa gctacttaag    60
tgacgatcca cnagtttgta tcaattgcca tgtaatgggc cttactatgc cacttggcaa   120
catagttccc acgcgatgcg tgccaccgca acgactgtcn tgtgccacac aacagtattt   180
ttagcaagta ttatttaagg catcagatgg tctgcggcac tcctatgtat ttaccatgag   240
```

```
gaacnacctc aacgcatgca ggccatatcg gcaagtcagg cggtaatcta tgacactgtg    300
tgcgttgcca cgctcaactc aatcaagaat ttgtccgtnc aggatgctga ccanggcgga    360
tattcgtact gcagaagaga aagcatgctg ggctgccaca ganatgtgcc tcatggaggc    420
aaaaacagcc ttagcgcaac gccaacggga ttatatcata cccaaagtcc cctgttccgc    480
agtggcttan gcctatataa g                                              501
```


(2) INFORMATION FOR SEQ ID NO:389

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 697 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...697

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:389

```
ctcgggtgaa ggaagtatgc gggagtaccg gtggaactga aagtcgtggt atgttggcag     60
caatctgtcc ggccttgccc atacccgaag ttatcagcga ccgttagagc catgcacttg    120
acgaacaatg aggtcgatag ccgcctttag tcgttgtctg cagggatggt acggatggct    180
tcagcttcat gtgccatatt tcggagatgg ttcgattgtg tatttctgcc ttcatgctca    240
ataaatgcgc tgcaaaagta tttatttaat tttgcatatt atgcttttaa ggcttttctt    300
tgcactaaat cttattcgat ttagaattgg aagggtggct aagaaaatgc aattaagcta    360
aaacattgag aaaagccctg aaagcatgat agcggaaggg tactatgtaa cggatattcc    420
gaatttataa atggattatc actatacacg ctgccgagcg gtttgcatgt ggtatataaa    480
ccgcatgcgg cgaagttaca tacgccggct ttgccatagg cgtcggcaca cgccacgaag    540
ctcgcggcat catggattgg ctcatctgac ggaacacatg ctcttcaagg caccagcctg    600
cgcaatagcc ttcagatcat tcgtcgcatg gaagaggcgg tgcncgagct taatgctttc    660
accgagaaag aatccaccta tgtgtatgca tctttttc                           697
```


(2) INFORMATION FOR SEQ ID NO:390

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 742 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...742

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:390

```
aagccgaaca tgcgtggtac gntgaccagc gtgtagcata gtaccggcag tagatggtca     60
```

```
gataggccag ccccttgcca aagacgatac ggagtgcgcg gagtagtggc tgatatcggt    120
aggtacgagg tcgtgaaact tattccttca cgcgccgtac cggccgagag tcctatgccg    180
agcaggagcg tctgcttatg atcaggatga gtacggcagg tagcaggaag gaagcgaaac    240
cgacgtcggg ttatacagtg ccacgtcttc atagtcgatg gggtaagaga tgattctccc    300
tgacgctcgg tagctcctac gctgcgcgct atcttgatct cttgttcatc tccagcgaaa    360
ccagtgtatt ggcaatgagc aggctttttgt agagagcaat ccgctcatat cgcagtaaag    420
agagatatgg gccttcctgc cgtattgaga tgttcggaga aatcctccgg aacgtagatg    480
atgccatagn attgcgcctg cggatttgct ccttggcctc ttccatatcg gtgcagtgtc    540
tacgatgctt acttcgggtg tggcatctac ccttcgcagg tattcgcgct cagtgtcgag    600
ttcgatctgt ccaccaccat ggccggcaca tcgcgtacac ttccgtggct gtatatatag    660
ctgtagagga gtgggtacag gaggggacta tgatgaaaaa gatgaccata cccatgtctc    720
tgaacgtctt gcacactcgt ac                                            742
```

(2) INFORMATION FOR SEQ ID NO:391

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 4129 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...4129

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:391

```
gcaagatcca agatgcttac acacaggcca cgaatggcaa tatcagccaa agatcaacgt     60
cagtgcggac tacgacatca gccgcatgct taccctgcag cttattacga ttgggatatg    120
aaccatccgc ttgtcagctc agcctcctcc ctatcacgaa cagcaatttc ggcgtcagct    180
tccgtttcaa tctgaccagt agcctaacgg cattacccac actcctcgta tcgcatttca    240
gcgaagccac ctcccatctc tgagatagtt gtatccatag tattcggata ttcatagtga    300
aatccatatc gtgaagaaag tatgaccgat atggatagga tacatggtct catatgagag    360
gatactatgg tctaacatga gaggatacta tgtctcataa aagttagaaa tggagaagag    420
aaaatgccgg atccctaccc tccacgaaca ttagatcgat cagatacgat aatcatgctt    480
cggagatgaa ccaatcgcct ttttcaagca gaaagccgat atgttgtgcg tttgagtgct    540
ctgattacct ttgccggaca ttacttttca aggattataa taatgatcat cgagcacttg    600
tccgatcccg agttttgcaa caagcatatg tgtattacat cgagatgatg ctgatataca    660
atctgccgaa aaagagttgc tcaacatctg gagcagacat acgacctata cctatattat    720
ctcctcttgg ttccgagctg acaagactgc atgcggaagc cctcgaagcc aacaagaaca    780
agcattagcg accgaaaagg acaaaaaccc caatctgcgt atggtacgca accgcttgcc    840
gaaaagatcg agagctgcag gcctttgtgg gtaagagccg aaagaatgct ctgaattggc    900
gttccgaaga agcttttctg cgacgcctgc taaaaagatc catttgtccg agactttcac    960
ccgttatatg agatccgatg caccgatgac ttcgaagccg accgcttgtt ctggaacgaa   1020
ctgatgcgca catcatcctc cccgatgaag aactggcaga agtgatggaa gagcaaagat   1080
cttctgggac aatcaaatac aactcatcga ggaaaatcga gaccagagaa gcttccgaca   1140
tagaggaggt ggaacagtcg gtacgacaag cagttgcgat ggcaactacc aaacgatccg   1200
acaggaaaat gcacctatcg aaatctgaag gagttcgtcc tcaagacaat ccgacggatc   1260
gagcaagaca ccgaccatcg gctatcctgc ttcctgcata caaggagaaa gacgatgccg   1320
tatcggcacc accctactgc gcaatgccat catcaacgga caggaatatc gcatatcatc   1380
cgtgaaaatc tgatcaactg ggaagtggat cgcatagcgg aatggatatg ctgatcatgc   1440
aactggctat cgccgagctg ctccacttcc gaatattccg gtcttggtaa cgatcaatga   1500
atacatcgac ctctccaagt gttcagtaca cccaagagcg gaacgttcgt aaacgggttg   1560
ctggatgcgt ggtcaaaagt ctcagagaga aaggcaaact actcaaataa gagcagggca   1620
aaacagctat cccccagatt tgacaaatga cagacgacaa aaagatcggg cagccatcgt   1680
aggctacggc aatatcggtc ggtatgcctt gcaaggctta gagaagctcc agattttgaa   1740
atagccggca ttgtccgccg caatcggccg aggttccctt cgagctccag cctttccgtg   1800
tagtatccga catgagcaac tcgaatcggt cgatgtggcc ttggtttgct caccaagtcg   1860
```

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tgagtagagc gaacagcctt ggagatattg aaaaagggaa tatgcactgc tacagtttcg   1920
acatccacga cggtattttg gccttgcgtc gatcgttggg gacgccgccg gaaaaagtgg   1980
ggcggcagcc gtcatcgctt caggctgggt ccgggcagcg actctgtagt gcgcacactg   2040
atgcaggcta tcgtacccaa gggatcacct acacgaactt cggtccgggc atgagcatgg   2100
ggcacacgta gccgtaaaag ccatagacgg tgtcaaggcc gcactttcta tgaccatcct   2160
ctcggaacgg gtgtacatcg tcgcatggtt tacgtagaac tgcttcggga cacaacttgg   2220
aggaggtatc ggctgccatc aaagcagacg agtattcgtt catgacgaaa cccacgtgat   2280
acaggtagat gaagtggatg ccccatcgat atggggcatg gcgtccgcat ggtgcgtaag   2340
ggtgtaagcg gcccacacaa aaccagcgaa tgtcattcga catggagata aacaaccccg   2400
cctcaccgga caagtactgg tctgtgcagc tcgagcagcc atgcgccaac acccggagct   2460
tacaccttac aggaaatccc cgtcatagac cttctccccg agacaggagc cagtggatag   2520
gaaaactttg ttgaaaaaga ttactcaata aacggttaat cggaacatta tgacactacc   2580
tgcattcatc acatgggttt cgatccggtt ctatttaccc tcttcgggca ccctattgtc   2640
tggtacgttt gctctttgca ttggggctga tcattctggg cccttggata gagaaaaaat   2700
gtgggaacac gagaagctgg attccaaatg gttcgagtcc ctggcgtcta tgtctttgta   2760
ggtactatcg tcggagcgcg tttgggacat gtctattcta tgacccggca tactatttgg   2820
ccaatccggc caagatattc gtacttggga gggtggcttg gcaagccacg gcggtaccat   2880
cgggatcatt aagcctgctg gctgtactca cgcagggtga cgcgcaaatc tattctatgg   2940
tattagatcg tttggctgtg cctacaggta tcgtggccgc catgatccgc tgggcaatct   3000
gaccaacagt gagattttcg gccgcccgac gacattactt ggggcttccg ctttattcgt   3060
tcggaagagt atcgtcactt ggtaccgaca tggacatggg atgtcatcct actcagatat   3120
acgaagcttt atgctattgg cggtctttgc cctctgtatg tggctatact ggaagcgcga   3180
tgctgccgac gctactccgg gctgatcgtg ggggtttttcc tgacaggtat cttctctctc   3240
gctttatcat cgaacgcatc aagatcgttc aggaaccatg ggactaaagc tcatcgaatc   3300
agtcggcctg aatatgggac agctgctcag caacctttcg ttcttgcagg catttggctt   3360
atcatccgtg ccgtaaagaa tcgattacgc agaaattatc ataacaacaa ataattataa   3420
aaatatccaa aatatgatgt atcaagttcc tcaagtaaca gactccgttt actacgtggc   3480
gtgaatgacc gctcgaaaag tctcttcgag aatatgtggc cgttgccaac ggtgtatcgt   3540
acaattcata tctcatcgtg gacgaaaaag tagccctatc gacacagtag atgtttgcta   3600
ttcggagatt ttcttcaaga agttggtaca gtcctcaaag gacgccctat cgactatctt   3660
atcgtcgatc acatgagccg gaccatagtg gctcgatagg cctgctgcgc caacgctatc   3720
ccaaatgcaa atcgtcggca acaagaagac tcatgggatg ctcgaaggct accccacatt   3780
accgaaggac ttctagaggt aaaagaaggc gacaaactct cctcggcaaa aatgagctta   3840
ctttcatttt cgctccgatg gtacactggc cgaagtaatg ttcacctaca tgccaaccca   3900
acaggtcttg ttctctgccg tgctttcggt acgttcggta cactcgacgg acatatattc   3960
gacaaggatt ggatctctct ttccgctggg aggagatgta ccgctactac gcctgcatgt   4020
gggcaagtac ggcagctttg tacagaaagt actcaccaag ttcaaggagc caatctgcct   4080
gttcaatata tatgctctac gcacggcccg tttggaaccg gcacacttc                4129
```

(2) INFORMATION FOR SEQ ID NO:392

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 646 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...646

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:392

```
aatggcaagc gtcttgcccc tgaagtgtac aatctcttag gcgtaaagga tttacctctc    60
agctgcccgc aggatccggc tcttatacgc tgccggtggt ctgcagcgtg gtgtgcatat   120
cttccgcatc acagaaggag gtaagccgcg tttgttcaga agtatctgat taagtaataa   180
tgggagtacg gccaaacctg cacgatttgg aggctaagga cgttttttccc aagataaaag   240
aggctcctcg gagttcgaca tagacttcgg ggcagtctct tcgttatatt ttcagtcact   300
```

```
gaatctgatt gaggaaggat tcggcatcat ttctatatta gattagtgcc gacatttgtc    360
atccgaaagc agacagtaat actttatcat caggcaaaga tattggtggc atttaacacc    420
gtgagcgagg ggttcgaccg gttaccgctc gtcacgaagt ggttttcccg cccaaagggc    480
gcgattttac caagaagaaa tagcagagcg tatcgtggat tgcgatgttc tctgttccga    540
ttcgacattc cgatcggtag ggatttgatt gacaaaggcc cgatcgctaa gttgatcgct    600
aactatgctg tcgggtacaa taatatcgat gtgactttgc agcatt                   646
```


(2) INFORMATION FOR SEQ ID NO:393

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 3018 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...3018

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:393

```
cttcacacgg ctcatcatcg atattccccc caataccatc agagagaggg gacgcagagt      60
atataataga tggtaggact cattggtcgc ctccttttctt ttcttgctaa acatacggag    120
catgcggtgc gtgacaccga aacctccacc acattgatgg tagcgaggat gatggccagt     180
cctccgaaga tttggcgagg atgagtttgc cgtcatgccc gaacttgaaa gataatccgg     240
cagctcaata gctccgatta cggttactcc ggagagagcg ttcatacccg acatagcgga     300
gtatgcagca agctcggcac attgctgatc agcttgtagc cgaaagcgtg gaagctatca     360
gcacgatgat aagaatgatc ggattcatta tttatgagtg attggtgtat tagctcaaat     420
gagtaagagc caaaggacgg cacttgagag gggtcgttcc ttggctcttg atattaagat     480
gtaggaacag tcgattacag acccattgct tcacgagtac cggcgtgttt gatttcgcct     540
cgcgagtaac gaggatcttg ctgcaaactt cgtcgttcat atccaattga tccgaccgtt     600
ctttgtgagg tacttcatca gattgtacat gttctgtcga acatccaagt agagcttttc     660
ggaagcatac cggggatgtt cttgatcctt ggatcatcac tccgtgcttc acttccttgg     720
ttcccttcgg cgtgattcgc agttaccgcc ctggtcgata gagatgtcca cgattacgga     780
gccggcttca tacccttcac catttcttcc gtgatgatga tcggagccac cttcccggga     840
tcaatgcgct acagaatacg atatccatat cctgaatggt ggcttgaggg cttcgcgttc     900
tttggccagt acatcatcgg gccatttgtt gcatatccgc cttcggcgat agccagttcg     960
gcaggaacgg tcggtatcca gatttggctc ccaagctctg agcctgttcg gcagctgcag    1020
ggcgaatatg gcagcataag tgatggctcc cagacgctta gccgtagcca aagcctgcag    1080
ccagccacac ccacaccgat caccattact ttggcgggcg gaatcatccg acagccgtac    1140
ccatcatcgg gatgaagctg gcgaagtctt cggcagcatc aggatacctt tgtagccggc    1200
acaagtactc atcgaagtca gtgcgcgagg ttttgtgcac gtgagatacg ggggatacca    1260
tcgagagtca gcgaataaca ccctgtttgg ccagattgcg taccatttcg tgggttcacc    1320
ggtaagccgg atgaatgaat gtgatcagat actgacccttt gcgcatcagc tcacttcgtg    1380
cgtattgagc tgttcgttga acaaaggctc ttttaccttg agatcacttc ggcaccgtca    1440
taaacggcct tagctccgtc taccagcgta cacctgcctg ggcatattct tcgtcatgat    1500
actgagcacc ttctcctgcc ctttttcaaa cagaactttg aacccgtctg ctacaaattt    1560
ggccactgtt caggggtagc cgacacacgg ttttcgccgt gcataatctc ttttggatgc    1620
caataatcat tgcttagatt cttttttgaat gtgattttct aaattaactg ccggaggtta    1680
acatcggctg ctccgaacgt ctgccggtgc atgagggtag gcgtccaaag gtcatcggga    1740
tgtaagccgc tgagcgacca caaaatagaa aagaaatgta tataatgcac ttattacgga    1800
cacttttctt caacggaacg cttattatca aagagtaaac ggaaaaacaa agaaaccact    1860
accaaactat cggcagagcg tgcatgcccc atattcgata gttgtgagta gggtttctct    1920
ttatttctca cccattcccg gtcggccggt cggagggtag tcctcgccat ttgcggccaa    1980
gagtagggga gactactgtg cttattgctc ttgagcaaat cgcgaatctc tgtaagcagt    2040
tcgatttcag gtgtcgggca gcaggagctg caggtgcctc ctcttctttc ctcttggcag    2100
ccatgatgct ttgatcatca ggaagatcac gaaagctaaa atcaggaagt ccaccgagtc    2160
tggataaaat tgccatagtt ccatgacact tccggtttca cgaccctccg ccttcgacga    2220
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cagccttgct caataccaat ttcagatctg tgaattgacc ccacccgtca gcaaactgat    2280
gggaggcatc atgatgtcgt tcacaacgag gtgacgatct ttccgaatgc gccaccgatg    2340
atcacaccga caccatgtcc actacgttac ccttaagggc aaacgctttg aagtcctgaa    2400
taatttcttc ataatacgct ttgttttttga tgagatctgt ccgccttggt ttgcaaactt    2460
agattgcata tctacagaga gttcccatac atgagttaga tctctaatta aacgcccaca    2520
gcactctttt ttcccgatgg aaaattcgtg ctactacctg tcaaatatag acacaaaatt    2580
atcgaaatga cctgtacgaa aaaaatcgta tgttgttttg tagtagatag gattgctgtg    2640
cttgtcactt gggaactcct gccgagagat tcttaatcaa ggggcgaggc tacaacgaac    2700
aacttgggca agcaggctta tattattggc ccaaggagac tcttataaca caacgaagga    2760
gagacaccgg aagttcctct cctttctatt gccaaaactg acttttagga cactattgat    2820
gcagatccga tatttatgtt ttggaaggta tctggtgagt agttttatcg gatatcgggg    2880
ctctcctcct cctcttcttc tttttgtacc cacatcaact ttttctgtgc gagtttttac    2940
catctgcggc tcgtgttttt cggaagaggt ggcgcgagat ttttttcgtc tggcgcgtaa    3000
aaattttact tctcgcgc                                                  3018
```

(2) INFORMATION FOR SEQ ID NO:394

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 557 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...557

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:394

```
gtcatcagtc cgaacggtca taagtatatc cgcgaataca atgtggataa ataccggcca     60
ccatctttcg cgtgggagga gtggtactca agcgcgaaaa gtattctgcc actacatcaa    120
tcgtgccata ttcaaataca cgctgatgaa gcacatagcg atacgctact gcgctttcgt    180
cccctgcttg ctttcagagc gtggcagctc tcactcacga aaacgggcag atcgaacgtg    240
gacattcccg gcccgaaacg gcatagggat cagcctctac aagggttatc cccactcttc    300
atgcagttca gcaaagaacc cgaataccgc gaggagggat attgtacaaa gacttcgaat    360
accccaagga aaaagagcgt ggatacgagt gtcggaggat ctttacatgc ccggcacatt    420
cgagattccc ataaaaaaag ggaatccatc tactttgctg ccggtctttg aagaggccaa    480
tccaaatacc ttcgaacgac atttgtcaag gaaagtacga gagcgcattc cacgccgaaa    540
attttcagc tgccttg                                                    557
```

(2) INFORMATION FOR SEQ ID NO:395

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 905 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

```
    (ix) FEATURE:
         (A) NAME/KEY: misc_feature
         (B) LOCATION 1...905

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:395

gcgaaattaa ttgtaaatat gactgtcgta aatacaggga aaatttaagt aaggtaaaaa      60
tagaatgaga aaagcttgtt tcatgggcct ggggtataag gtctgccaac ggcaattgta     120
actgccaaaa gtggaataga agtattaggg tagatataaa caccaatatc gttgcaaaaa     180
ccaattcagg aaaattcact ttgtggaagc aggtatggaa gatcttttac aggaagttat     240
acaaaagaaa cattccgtgc ttctacaaca ccggaggata gcgatgttta tctgttgtgg     300
tgcctacacc cttcaaggcc aatcatgagc cggacattac atggtagagg ctgcaacaag     360
atcaatactt cccttgctca agaagggcga ttatttatta tcgaatctac ctctccgata     420
ggaacaacag agcagatggc tatctaatct atcgagagcg tcccgaactt aaagaccaat     480
tatatatggc tactgtccgg aacgtatcct tcccggtaat gttatttatg aactggagcc     540
aacgatcggg tcatcggggg cttaagcgca gaagcgaccg aacgggcaaa gagttctatg     600
ctcattttgt taaaggaacc ttgcatggaa ctaatgccgt acagcagaac tctgcaagct     660
tacagagaat gctagccgag atgtacgatc gcgtttgcca acgaactttc tttcatttgt     720
gacaaagccg gaatcatgtg tgggaactta tcgaactggc caataagcat ccaagggtga     780
atatcttcag cccggtagtg gagtaggggg gcattgtatt gcggtggatc cgtttttaat     840
ctcttcggct ttcctctgga gagtaaactg attgccggtg ctgtgaatca atactaccag     900
gcttt                                                                  905


(2) INFORMATION FOR SEQ ID NO:396

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 535 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

   (ii) MOLECULE TYPE: DNA (genomic)

  (iii) HYPOTHETICAL: NO

   (iv) ANTI-SENSE: UNKNOWN

   (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

   (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...535

   (xi) SEQUENCE DESCRIPTION: SEQ ID NO:396

ggaatgttcg ctcgagttac agatattact cacaagagta tagaagagta aaaaatcttc      60
gccatttggg atttaatgga ataactgttg gaactgaacc ggagatgatc tgacattatt     120
gcatatgaat aagaaaacaa cttcagcgaa acgatagaaa acctcaagaa gtttgaagag     180
gcaggcatag aatatttgtg tcctatctta caggattggc cggtgccgga aatggagaaa     240
gaaatcttta gctacttccg atatgtttaa tcaattacat ccttatatca tttcgttgta     300
tcattaacga tttttcctga cacagttcta tttcaagaaa ttcacagggg ctttttagag     360
aggcgtctga acatgagaga ttaaaagagc tagcaccttt ataagtaatc tgaaaatcaa     420
tacgaatttc ttcgcaaata cgtatctaat cctgttccat taacgggata cttgcccaat     480
gataaaaaga attgatcaat gagctttccg atgttattaa tgccgtagat gaaag          535


(2) INFORMATION FOR SEQ ID NO:397

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 1005 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

   (ii) MOLECULE TYPE: DNA (genomic)
```

(iii) HYPOTHETICAL: NO

(iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
  (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
  (A) NAME/KEY: misc_feature
  (B) LOCATION 1...1005

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:397

```
aggcataccc tttttcaggc gagagaaata ctgttcggag acgtcgatgg gagctttacg     60
ggagctatct gttctaccac atagataggt ttcgtgggga agccatatcg ccgctatcat    120
aattgcgtgc ggtaatcaca ccggataagg gcttcggagc acggtgttct ccagcagatt    180
gttgtaagta gtctcgccac gtcgagctgc gtttttgagcg catcccactg ctgtttggct    240
atgcccctat tttgtacagc tcatccatac gctggaaatt ggtgcgcgta ttctcagttg    300
tactttggcc tgggtcagtt ggctccgatc caactcggcg agccctgtcc gcgtcccact    360
cgatcaccta cttcggccgt aaggcgtacg atctattgcc catctgaggg gtaatgttgt    420
tggtcacttc ggcccgaacg gagctgtgaa actcagtacc tcattcagcg tgtcggtctt    480
cactatagtc tctccaccaa tttggctgcc atagctgccg aatcagcagc agacggccgc    540
tctctttctt gccattgcag ctcgtgagaa tgaggaacgg caggactaga ggaggatagc    600
actgcccagt gtattcgatc ttttcatatt tatcataagg tgtattttgt tactatttac    660
tttttacgct cattgttcgg gaatcccatg ccgttcatct tgtccaattc ggcctttgcg    720
gtcataaagt cgaattggcc tgattataat tgagtcnagc ctgcaaaaga gccacatcgg    780
catcgttgag ctcgacgaga gtgccttcgc ctgtctgata gcgtttctct gcttctgata    840
gccctttct gcacttcgga cagcctcttc cgaggccaca aactctgcat acaggtacgc    900
agacggtcat tttggttctt gattcccatt cgatggattg ctctatgtgg ccgtcgttgc    960
atatcgatct gacggatcga aaaagcactt tgcttcacgt tgtac               1005
```

(2) INFORMATION FOR SEQ ID NO:398

(i) SEQUENCE CHARACTERISTICS:
  (A) LENGTH: 352 base pairs
  (B) TYPE: nucleic acid
  (C) STRANDEDNESS: double
  (D) TOPOLOGY: circular

(ii) MOLECULE TYPE: DNA (genomic)

(iii) HYPOTHETICAL: NO

(iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
  (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
  (A) NAME/KEY: misc_feature
  (B) LOCATION 1...352

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:398

```
aggaacgagt cagagccatc gaggcacagn tgcgcgaaga gttgtccccg ccattncgtt     60
cgatggtgtg gccgaagnac gtgtcctcgg agccatcgtg nagaggagat gaagcggccc    120
gtggatatgg ccacgctgca gcagcganca tccgagaggg aatctgggta cgccccttcg    180
gtcgtctgnt gctatcggag ccacccttna tcatatcgcc ggaagatcta tcgtatcctt    240
acgcaggact tctccgtgta ctcggtcagg atcganccat tncatttacc cgataataca    300
aganntatgt ccgaaacaaa ngaaagactc tgcatatacg ccgctnccca ta           352
```

(2) INFORMATION FOR SEQ ID NO:399

(i) SEQUENCE CHARACTERISTICS:
  (A) LENGTH: 509 base pairs
  (B) TYPE: nucleic acid

```
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
         (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
         (A) NAME/KEY: misc_feature
         (B) LOCATION 1...509

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:399
```

```
agctcttttg ctgcagagca gattcttagt gtcttcggga aaggtcaaac tccggtatat      60
gggcacacca agcaaacaga aattttccca agtttccata gagaagtact cctttcctcg     120
tcaaataggc gagaaataag aaacgatgtc agctgattct tgcttcctgc atgatgcagg     180
acgcgattgt cagctgttct tgcttcctgc acgatgcagg acgcgattgt cagttgattc     240
ttgctcctgc acgatgcagg acgcgattgt cagctgattc ttgcttcctg cacgtgcagg     300
acgcgattgt cagctgattc ttgcttcctg cacgatgcag gaccgattgt cagttgattc     360
ttgcttcctg cacgatgcag gacgcgattg tcgttgattc ttgcttcctg cacgatgcag     420
gacgcgattg tcagttgatt ctgcttcctg cacgatgcag gacgcgattg tcagctgatt     480
cttgcttcct cacgatgcag gacgcgatt                                       509
```

```
(2) INFORMATION FOR SEQ ID NO:400

     (i) SEQUENCE CHARACTERISTICS:
         (A) LENGTH: 438 base pairs
         (B) TYPE: nucleic acid
         (C) STRANDEDNESS: double
         (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
         (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
         (A) NAME/KEY: misc_feature
         (B) LOCATION 1...438

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:400
```

```
aggccgctct ggcagaagcc gtgtggggag actatataga ccaagcggaa attatgactt      60
tgtctatgct caaatcaaaa atctgcgcaa gcagatgacg atgcaggggc gacgatcgag     120
atcaaatcgg tatatggatt cggttataac tcatagaaag agaagaagat acttgaaact     180
atcctatcga atagtatgcg ttttgtcttg ctgtcttcct cgtggtattt accgcctggg     240
tgatactttc tattatgtaa tcgtcgaaga aatnaacgac gagacgaacg attcttggag     300
aactactccg aacatgtcat ccgcaatatc ctctccgaca atctctttcc accggctgaa     360
aacgacctta acaacactta ctccattcgg gaattacccc acaggaggct atgcgtttcg     420
ctcacgatat ttactacc                                                   438
```

```
(2) INFORMATION FOR SEQ ID NO:401

     (i) SEQUENCE CHARACTERISTICS:
         (A) LENGTH: 585 base pairs
         (B) TYPE: nucleic acid
         (C) STRANDEDNESS: double
```

    (D) TOPOLOGY: circular

  (ii) MOLECULE TYPE: DNA (genomic)

 (iii) HYPOTHETICAL: NO

  (iv) ANTI-SENSE: UNKNOWN

  (vi) ORIGINAL SOURCE:
    (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

  (ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...585

  (xi) SEQUENCE DESCRIPTION: SEQ ID NO:401

```
gattctcaag aatttcaatt gaaattttga caaaaagttc tatatttgca cttaatcatt     60
agtacttgaa gctctatttc tcttaagttt cgcccttaat cagcgtagaa aattatcacc    120
gctatgggga accgaagaca aacagatctg acaagtccgt atcgaaaaca aaacaaccct    180
accctatttc gcttattcga tcctgtataa ttttcgcaag atgccgccac gtcccgacca    240
aaatgatccg aagaggcaga aggacggtta tttgctcaag ctatcatcca acggagtaca    300
ccaccgagga cctttgtcgg gacatttcgg acaggtcgtc cttagctccg gcgacatcac    360
gggactgatg atagccatgg aggagttgat atcgagtatc tggcttcggg ctatagcttc    420
cggctgggca atatcggcac atatcggcca aagtaaaatc gcgcggagta agagacaaaa    480
aggaaatccg tccggttccg tccaagcccg tggatatcaa tttccgttcc acaccgcaac    540
caaacgacgg atgcgcagca tgagtgtgaa gcgcggtccg agctt                    585
```


(2) INFORMATION FOR SEQ ID NO:402

    (i) SEQUENCE CHARACTERISTICS:
      (A) LENGTH: 4412 base pairs
      (B) TYPE: nucleic acid
      (C) STRANDEDNESS: double
      (D) TOPOLOGY: circular

  (ii) MOLECULE TYPE: DNA (genomic)

 (iii) HYPOTHETICAL: NO

  (iv) ANTI-SENSE: UNKNOWN

  (vi) ORIGINAL SOURCE:
    (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

  (ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...4412

  (xi) SEQUENCE DESCRIPTION: SEQ ID NO:402

```
gccgtggatc ggatcgtagg cggattggag aaaaagaaca aaatcaccaa gaggaggagc     60
gtcgcagcat cgccatccac gaagccggac acgctacttc agttggatgc tacgctatgc    120
caatcctctc gtcaaagtca ctatcgtccg cgaggcaagg cactcggtgc cgcctggtat    180
ctgccggaag agcgtcgatc acgacaacgg aggctctgca ggatcagctt tgcgcccttt    240
tgggtgacgt gccgccgaag atctcttcct cggacgtgta tcgaccggtg cagcaatgac    300
ttggagcgcg ttacgaagtt ggcttacgcc atggttacct atttggcatg agcgacaagc    360
tgcccaacat caactactac gaaatgcaaa acacggctgg aatctgacaa agccgtacag    420
tgatactacc gccgaggtta tgatgccgaa gtaaacagaa taatatccga acaatacgag    480
cgcgccaaaa cattctgcgc gagcatgaag ccgggcacca cgaactggca gatctgttgt    540
caagcgcgaa gtgattctgg ctgatgacgt agagcgtata ttcggcaacg cccctgggct    600
tcgcgtacag aagaattgct tgggctgaat gcaccggtac cgccacagaa gagacaacag    660
cggatgccga agcacccatt cccgttaggg agaagagaag acggaagaac atcccgaata    720
aaatataaag agacttcgag cttacgttat gaaagcagtt ttgattcgca gcctcagtgg    780
tctgtctata tggccctgat catccttccc gtcgtactaa gggaaccggc tttttcttag    840
cggttttgc cgtttttcatc gtgttgggac tgcgggaatt cgctcgctgg tcaatctgaa    900
tcgcacacgt cccccttcggg cattcatgga cgacttttcg gtgccttcct ctttgcggcc    960
```

```
atcttcctat acggcagtga cgaatggatg tcacgatatt tatcccgtat atcttctatg    1020
tcctctacat atggtgcgca gtctatattc ggatcgccat aaggccggat cggacaatgc    1080
cgcactttca tggggcatct gtatatagcg gcaacgcttg gtttgggagt cttctgctcg    1140
tgcccgaaag tatcggcagg gagttggcag taggagagtg gcagacttca cgcctcacta    1200
cttcctcttc gtttttgtgc tgataggctg aatgatacag gagcttttat tgcaggttcc    1260
ctctttggca agcaacactc ttcaaggtca tatcacccaa gaaaacatgg gagggcttta    1320
tcgagggctg ctgttcactg tggcaggtgc attgctggca ggccactatt ccgttcggcc    1380
aagcatccga tggagctggt cttctttgct ctactggtaa cgccatggcc acttggggcg    1440
atctgtatga gtccaatctc aaacgcaatg aggagtgaag gattccggcc atatcattcc    1500
cggacatgga ggtatactga ccggctggac agtgctctct tcgtattccc ggccgtctat    1560
cttttcatct gatcttcgga ttgtaagcat ttttcccggc cacccattcc gacgaggaaa    1620
gagaccggcg gaagctctga taaaagcaac cccccgaaag ccgtggtttc gggggttcct    1680
tgtattatac cctcactctc cttgccatgt ctattgcaag gagagtggaa gaattggggtt   1740
ttcagcacaa ctcactattc actttcagag aagacgctgg ctgcgacgaa tgaattcggc    1800
caaagcctct ccctcagcaa tccgcttccg agcagagcca agtcgatgag ctgacctatc    1860
agtcgttgtc ctgagcatat ttggtcagtt gatcgttgat actgccttcg gtttggcctg    1920
ttcgacggcg ttgttctcct tggcttcctt cgtggcaaca ggatttcctc cggtttcttc    1980
cctttttcct catcgagcag cttggcctct ccgctttcag ctcggcgatt ttcgctctaa    2040
gctctgtgag cgaaggctta ccgattcttt ctcaccggag agtaccctgt cgatgagcgg    2100
atgatcgtat taagtaccag attgtacgaa tcggggagtt cgccgtagaa gctcatcccg    2160
gctgcagctg tgccatatcg cgcatacggc gcatgaattc ggctttgtga taaggatggc    2220
ttcaccttcg gctccgagcg attcgaaagc tacatgaagt gcttcttctc gtcccgtggc    2280
aggcgtgctt cgaacagctt cacagagtgg cgcgctccgt atcggacagt ttcacttcgg    2340
ctctttcctc ctgcggatca gattgttgat cgtatcgcta tcgacacgga caaagtgtgt    2400
ctctccaact tttgctccag caggctcacg atatgcggat ccaactgacc tccaacagca    2460
tcacgctgta gcctttgtcg gatgcacgtt tcacgtggcg tactgtccat gcttgtccgt    2520
agcatagaga tacactacct gtccgtccta tccgtctgta caccttcgac gagcgttcgg    2580
tattcgtcga acgtgtattg tgtccgtcca tatcggtgaa aaggaagaat ttggctgcac    2640
gctcatgaac ttctcatccg tcagcatacc gtattcgacg aagagcttca gactacccat    2700
ttctcctcga atgtggggcg gtcgttttg aaaatttctt ccagcggtct gccaccttct     2760
tggtgatatg agacgagatc ttcttcacat tggatcgctc tgcagatagg agcgcgatac     2820
gttgagggga atatccggcg aacgatgacc ccgtgcagga gggtgaggaa gtccggcacg     2880
ataccctgta ctcatcggtg acgtaaacct gattgcagta gagctgaatc ttgttgcgct     2940
cagatccaag ttgttttttga tcttcgggaa atagaggata cctgtcagat gaacggatag    3000
tccacattga ggtggatcca gaagagaggc tcttcggaat gggatagagc gaacggtaaa     3060
attccttata gtcttcgtcc ttgaggtggc aggctttttg gtccaggcag gatgtgtgtc     3120
gttgatctga ttgtcccgtc cgtatcttgc atcttgccgt ctttccattc ctgcttcttg     3180
ccgaaatgat cggcacggta aggaacttac agtatttgcc gaggagcccc tctactttc     3240
ttttttgagg aactcgctat tctcctcatc gatgtgcatc acgtgtcggt gccacggtca    .3300
gccttgtccg caggttcgag cgtgtattcg gggatccgtc gcagctccat ttcaccgccg     3360
tagcatcttc tcggaaagag ccgtgatcac gtccactcgc tcggacacca tgaaagccga     3420
gtaaaatccg gtccgaagtg gccgataatg gcggccttgt cgtctttgta cttttcaaga     3480
actcttccgc actggagaaa gcaatctgat tgatgtactt ctccacctct cttcggtcat     3540
ccctacgccg cggtcgctga ccgtgatcgt gcgtgccctt catccacgct gaccgttacg     3600
cggaggtcac ccgtctcgcc tttgaatcgc cgacggatgt aagcgttttc agcttctgcg     3660
tagcatccac ggcatggaga cgatctcacg caggaatatc tcatggtcgc tgtacaggaa     3720
tttttgatga cggggaatat attgtcgctc gttaccccga ttgttccttt cttctcatag     3780
tgtattatta tctgttaatg ttttgtttgt ttctattccg tcaaaggaac gacaaatccg     3840
atgccacagg gtccggaact gacaatctgg ccattctttc attcagactg ccttttttcgc    3900
ttccgaatga ttgacgtgta tgaaaaatcc ggtgtatttc agttctgaaa aacgtggtct     3960
gagaaaattt tattttggtt cgggagttga aaaaatctcg cctgagaacg aaaagatttc     4020
gcaccatttt tggggggattt tggtttcaga tttgggcgat tttcggtcga gtttctatgc    4080
gattgataac ctcacgtcag ctcgacgtaa gaaaagccaa tggatcaatg aacccttttc     4140
gcctccgccg gaagaacaaa atcagtcttt ccgtaggcag ggggatcccc ctcaaatccc     4200
aaaagtcttg tattgagcga ctcagctctc atactaaaaa ctcccccctc taagcaaaca     4260
tttggacact attgatttga tagcggtttt tctatacaaa cgatgatccc ggccctgct      4320
tgaaactgaa ttttgacaca ccctcttctg gtagttgggg taatttaggc cttgcgtttt     4380
                                                                       4412
ttttctgcgg aaaggttgcc gtctttaacc ta
```

(2) INFORMATION FOR SEQ ID NO:403

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 1007 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

(ii) MOLECULE TYPE: DNA (genomic)

(iii) HYPOTHETICAL: NO

(iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
    (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...1007

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:403

```
ggacgaatcg tcctgtcgcc gcacgcagcc cgactgtttg ttttcgaatg cagctctgcg    60
ccggtttttt acttccgacg cttgcgctgt ttggagtcaa cttgtcgtag aaacgtcctt   120
ccgtcggttt ctctttgcga cctttgtttt gcgtgaagtg ggattttcac tacgtcgccc   180
gtcgaaatct ttgcgagagc ggaaaagttc ttatctccgc cttttttccc cccggcatag   240
tcttttttggt atccgcatac tctacatgga tgcggcgacc atccacttcg taccattgag   300
ggtttctact acgttcttgg cttcgaactc gtctacatcg aagaagcgaa tcggggcatc   360
aggtcgatcc gtccgatatt gacacgcccc ggatacaacg gttgatcagc tcgatcagtc   420
ggttgggaaa catttgatcc acttgccaaa attgatgaac agacgggtca tcccttcttc   480
tgcttcgccg ctcctcgttt tcggttttta cgatctcccg aaacctcgtc ttttttttctt   540
cgaccacttc ttccacgtct tcggcacgtt ggtaatagtc gagcatgcat tgaactccaa   600
tgccattacc cgacgaatca attcgtcttt ttcaatcatt cgagcttctt gttcacttcg   660
ttcaagacag agtcgatggc cgttgtttct ctatatccac acgttctata cgatcggcca   720
gattgaacag ttgctttcgc atatctctgc tccggaaggg atgcgtgcac gttcgatctg   780
cttcgcatcg tgcgctctat attcttgatt ttgcctttct ccttgacatg gcaatggcga   840
tcgaaagacc tgttttccct gcacgagctg tacgaccgct gcgtgggtgt agctctctac   900
atcatcggga agaccgaagt gaatcacatg gtcagatcgt tcacatccaa tccgcgggca   960
gccacatcgg tggcaacgag agttgaaggt tgcggacgcg aaacttc                1007
```

(2) INFORMATION FOR SEQ ID NO:404

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 497 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...497

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:404

```
ggctcccgag tatctcttca tcgtctttgt aacgcccgta gggccgtatt caaagaagga    60
ttcaaaccga ccaagatggc catcttccgc gactatgacg tgcagctcct ctgggtacgg   120
gtacgatcaa agtgggcggt aactatgagc cggtatgatc cccacagtga aagctcacga   180
aatgggctac tctgcactat cttcttggat gccaaagaaa agaagtacat agacgaagcc   240
ggtccgccaa cttcttcgcc atcaagaaca atacttatat cactcccgaa tccactctat   300
cctgccctct atcacaaaca agagtctgat gcaggtggct cagatctggg tctgaaggta   360
gagcgtcgtc cggtagccga agaagagctt gcactttcga agaagcaggt gcttgtggta   420
cggcagccgt gatcagccct actccgagat tgacgaactt ggagaacaac aaacagtacc   480
gtcatcagca gggacgg                                                   497
```

(2) INFORMATION FOR SEQ ID NO:405

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 516 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...516

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:405

```
atatcgaccg atgcgaacga aacgacaagc gcaccatcga caacgtcatt atcgcgacgg      60
caagtccgct ccgttctata tcaaacgttt cagcgtcacg gtgttacgcg agacaaggag     120
tacaacctta cgcaggaaac ggccggtgtc gggtgatgta tttcaccgcc aataaaaatg     180
gcgaggcaga daccgtagga tcatcctcaa accgaaagct cgccagcggg tactttcttt     240
cgagaagact ttagcaatgt cgccatcaag gggcgaagca gcaagggcaa tctgtgacca     300
aagcagaggt gcacaagatc ctgttcaaac agcangggtg cttcaccctc ggagggcgga     360
aangtttggt tcgatcggga cgtgatgcga ctaactacga ccgagcangg gcgaatatct     420
ttgggcgaaa ttcccaaagc caaccgattt cgatggcttg gtaaatcctt tgggattaaa     480
ccgggggacc ggcttattac ctaacaattc ccataa                              516
```

(2) INFORMATION FOR SEQ ID NO:406

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 989 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...989

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:406

```
gacgctcatt accgttccga ccaatgccag aatgctgaag aggagaagaa accgctaagt      60
gaacgttcct cctcgctgtg cgaggctatg atgtcttcga acgcaggatt tcggtatagg     120
gctgccccgt aatacgggag taaacggctg tatgctttga atcaactgct ccggatcggc     180
cccttccgaa tagccgccag tacggaccac gaccaggcgg atgactgggg ataagggatg     240
aagagtagct cggatgcggc tccttgaatc cgccgaagtg aacctcggga gcatgccgca     300
ataatagaac tcaccggctt tgccccaatg aatgacaccg tccgcagatt ggctacatcg     360
aaatcgttgt aggccgatcg gctgagatag aggtgcgatc gggcttgtcg gccttgcgac     420
cgttgggctt catcttcaga tgaacaggct cagtgccacg gagtctatgg agaaaatctg     480
catggagaga gcctgccacg gtattcggaa gagttgttgt tgcctccgtt cagcggagtc     540
cacgcgtgag gcctataccc gttatgccgg ggattttggc tatttcggtc tcatcgtact     600
gacgatctgc ggatccagtc cgaaaacgtc tatgatcgtt tgttcctgta atcgtagccc     660
```

```
atgtcggagt tggtcatata gtcgattgca cggccattac catggtacag ctcagcagga      720
tcatcgtaat ggcatctggg aaatgaccat aatctgcgag aagctgcttt tgaccacacg      780
gcgaacttgc cgctgaccac ctcgatcgga cgaaaccgcg atatgaacca tgcggcaggg      840
ccgcacacac gatgctcagc aggagcatga agccgattag cataggatga gcgtgagcga      900
aatatgccgt gccagataga gatgcgtatc gacaggcgat cgaatacggg ttcaagggcg      960
aacatgccga atacggccag agcgtgctc                                        989
```

(2) INFORMATION FOR SEQ ID NO:407

    (i) SEQUENCE CHARACTERISTICS:
       (A) LENGTH: 533 base pairs
       (B) TYPE: nucleic acid
       (C) STRANDEDNESS: double
       (D) TOPOLOGY: circular

   (ii) MOLECULE TYPE: DNA (genomic)

  (iii) HYPOTHETICAL: NO

   (iv) ANTI-SENSE: UNKNOWN

   (vi) ORIGINAL SOURCE:
       (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

   (ix) FEATURE:
       (A) NAME/KEY: misc_feature
       (B) LOCATION 1...533

   (xi) SEQUENCE DESCRIPTION: SEQ ID NO:407

```
gatcccctgc ccgaatttte gtatgcctat cgcaacaaag gtacattttc ttttattgta      60
aaggtctatt tagcattttt atgcaggcac agcagcagca ttcgacccat cgtttaccgc      120
tccggatcgg cgtccaggca gaataccaca ttccgaagag ctgagagaga acggggagaa      180
aatcgagttt acgctcagaa ttgttccacc caacgcccct aaaaacgtgg cgcgagattt      240
ttttcttttg gtgcgggaag gaaaaaattt acgcgcgaga acgaaatagt tttgttcgtg      300
tttttcagga aaacacacgc cgcaatctgc tcgtttacgg ttctaaatcg cgaacgaaaa      360
tgtgcgaaga aaaggaaagg atacttctca tgatcgattg ttcagtcgga ttttgagtgt      420
gcccgtatcg gattggtctg cgctatgctc cgctttattc tttgcctttg tcctaaattt      480
gcaccacgtn gttttatacg ggagagaact actcccctcc cctactgact caa            533
```

(2) INFORMATION FOR SEQ ID NO:408

    (i) SEQUENCE CHARACTERISTICS:
       (A) LENGTH: 482 base pairs
       (B) TYPE: nucleic acid
       (C) STRANDEDNESS: double
       (D) TOPOLOGY: circular

   (ii) MOLECULE TYPE: DNA (genomic)

  (iii) HYPOTHETICAL: NO

   (iv) ANTI-SENSE: UNKNOWN

   (vi) ORIGINAL SOURCE:
       (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

   (ix) FEATURE:
       (A) NAME/KEY: misc_feature
       (B) LOCATION 1...482

   (xi) SEQUENCE DESCRIPTION: SEQ ID NO:408

```
gggaagaact gagcattggg gaatctcttc acatagtctg atactacgtg ttaccgctgt      60
cacggaggtc aagcatgcat cggaatttct ccggtgtgtg ataccgtcgg ggtcgtaaac      120.
atagccgtca ggaccggaga tcgtaacacc ttaatgccca actcggtagc tttctgagcc      180
```

```
acacccccaag caacgtaccg aatccggaga tagcaagagt tttgcccttg tagtctacac    240
cgtttgctta cacatgttct gtacgaagta aacagcaccg aaaccggtag attcggacgc    300
agacgagaac cgccgaactc gaatccttg ccggtaagcg tactgtgtgc tcgcgagcga     360
gcttcttgta cataccgaac atataaccta cttgcgaccg ctacgccgat gtcacccggc    420
aggaatgtcg gtgttagggc catgttgcgc cacaaatttc ggtcatgaag ctctggcaga    480
aa                                                                   482
```


(2) INFORMATION FOR SEQ ID NO:409·

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 1900 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...1900

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:409

```
tcttcagtct tggcaaagat gaactgactc agaaaatgat ggtcaattca ccggacgcaa    60
atgggagttc actttcacta cattggttac tttcggagag ctctctttgc ttcgtttcct    120
cttttctata gcaccagctt cggaggacat attgggtatg gatgctgatc ctcttctgct    180
tcattatcca agctgttcct acgagtatca atccaaacat ggtaatgtat gggggaggaa    240
aacctccaaa tactgctttt catcaatggt gtactggctc cggttctgct cggaccgctg    300
tttccacatt ctttacgggc agcagcttcg tggtaaacaa gatgcgatgt tcgacctctc    360
cggcggcaac cagatcgttt ctgcctggca gccttcaatg ggtggcaact gagaggcctt    420
gaagctgttt tgaacctgtg gacgtggttc tcggattggc tgtattcttc cttgccagag    480
tatcggctct ctttatttca tcaataatat cgatgacgaa agtctctatg cggcagccaa    540
cgccgacttt gggccaatac ggtcgcattc ctgattttct ttctggcaac atagctttcc    600
tgctgactac ggaaggattt gccgtgaatc ccgtttcaaa gaggtgtata tggagccata    660
caagtacctg tacaatttct tggatagccg gccgttctgg ctgtattcct gttgggagta    720
atcctcgtac ttggcgtata ggtttgactc tactgcgtaa aggcttcaaa cgcggaatct    780
ggctcacggt acgggaaccg tactgactgt gcttgcccta ctacttgtag ccgttggaac    840
gatacgtctt ggtacccctc cacatacgat ctgcaaagtt cgttacgatc gagaatgcca    900
gctccagcca tttcacgctg aaggtaatga gtacgtctct ctccttattc ctttcgtttt    960
ggcttacatt ttctatgctt gcgcgcactg gacatttcgt aaaatcacaa aaaaagaaat   1020
ggagcaggag atcacgtcta ttgatctctg acagataatt ccacaatctg aggctgtgca   1080
ttgaggttcg atcccttgat acagcctcat tgcttttata tatttcgcaa taatcatgac   1140
cgacgatttg aaaagacggc tatatttacc tgaccaacga tagcaatatg gctcagtcat   1200
catatcaaac cgcaccgcat cggatggctt ggctcttagc ggcggagcgg ccaaaggctt   1260
tgcacattcg ggagactcca tgctcttgag gacaatggga ttcgtcccga catcatagca   1320
ggtcgagtgc aggagcgttg gtagctgcac tctatgccga tggatacagg ccgaagagat   1380
tccacaatta ttccgaggca aaaatttcag attcctaaca ggtggcaaat accacaaaga   1440
ggtgtattca gcatccaacg cttcaagagt ttcttcgctc gactttacgc cacaagaata   1500
tcgaagacct accccttcca tcagaatagt ggcaacggac cttgaccgtg gagttgtcaa   1560
agtttttttac aaggctctct cgtcgagact gtcacggctt cctgtagcat tccgatctat   1620
tcaaccctgt agagatagat ggaaccacct atgtcgatgg aggactttca aagaccttcc   1680
ggcttctgtc attcgtgaag actgccgtta tctcaaggag tacacctcaa tcccaaagag   1740
ccttccgact ataaaaagag tctttcggca ttgcagagcg ttgcttcggc tacatcttcc   1800
gagcgaactc cctcccgatc gcaagctgtg cgatttgctg atcgaatcaa gagaaataat   1860
cagttcaaac cattccacgt ggagccggca gaagaaattg                          1900
```


(2) INFORMATION FOR SEQ ID NO:410   .

    (i) SEQUENCE CHARACTERISTICS:

        (A) LENGTH: 1045 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

   (ii) MOLECULE TYPE: DNA (genomic)

  (iii) HYPOTHETICAL: NO

   (iv) ANTI-SENSE: UNKNOWN

   (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

   (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...1045

   (xi) SEQUENCE DESCRIPTION: SEQ ID NO:410

```
ctgcattgga cacgttggct catcgttcga tgaacctatc gtcatctgtc gatccggaaa     60
ccaaactcat gcgcggtaga aatcaggatg gtagtttcgg acaccttttt cccctttcaa    120
atggggagat gtattcacgg agggcaagcc tggcactaca cttggtcggt ctttcatgat    180
gtgcaggggc ttatcgcctg atgggaggag atcgcccgtt cgtgtctatg ctcgattcgg    240
tattcatact cctcctatgt tcgatgagag ctattacgga tttgtcatcc acgaatcaga    300
gagatgcaaa tagcggatat gggcaattat gctcatggca atcacccata cagcatatga    360
tatatctgta taatcatgcc ggtcatccat ggaagctcag gagagactac gcgaagtgat    420
ggggcggctc tatcgtccta cccggatggg tattgcggcg atgaagacaa cggacagact    480
tcggcttggt cgttttctct gctttaggct tctatcctgt tacacccgct acggatcaga    540
tgtgctcggt tcgccgattt tttccaaggt aatactctct tttcccgagg acacaaaacg    600
gtgttgcatg ctccggccaa cagtgccgat acgccttcat ccgctcgatc agcgtagaag    660
gaaaagaatg gagctgcaat tacctgctca cgaacagctt cgctcttctg catccattca    720
atggatgatg gacacaaacc caattataat cgtggtatga aggaaagtga cagaccttat    780
tcctctccac ggagcaacag cgtcgcgcta atcacagtaa ttaatgatac attccccact    840
tcggactatg aatacgaaca aagcatttac gccccgacga tcatactgat gagcttgctt    900
ggcttttttcc tccttgtgct aagctctgcc gatgtaaaga tgatgtccag accgacatat    960
ttaaggggcc tgtggactac tgaatcctta tatgggcaat atcagtcatc tgctcattcc   1020
cactttttcca ctgtgcattg gccca                                        1045
```

(2) INFORMATION FOR SEQ ID NO:411

     (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 582 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

   (ii) MOLECULE TYPE: DNA (genomic)

  (iii) HYPOTHETICAL: NO

   (iv) ANTI-SENSE: UNKNOWN

   (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

   (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...582

   (xi) SEQUENCE DESCRIPTION: SEQ ID NO:411

```
gtggtaataa aactattacc cgattcgctt cggatacaac cgctgatcta aaattaattt     60
gacctctcta aacgaaattt ttcattcaga attcgacact cttattaatc aaccaaacgg    120
aaaaggatat gaacaaaaag aacattacat cggatcaatc atcgcagtac tcgccatact    180
gcttatcacc tctttctgtg gaatagagat gtacgtaata aattgcggat cgctcagcac    240
aatgtgaagc cgcattggac tccattcgtt acctcaaaga tgccaatgga aatcctatgc    300
```

```
ggaaaagaaa tcgttcatcg ccactatcag cgaattgaaa gaatgaacac tgagatgtac    360
gagaatatcc agtctttgca aaagaaactg caaagaaaat tctggcaggc tccgatatag    420
gcgtagtcgt agtggacacc attatcagga caagatcatc gaatacacgt tagacagtct    480
ggtaaatatc ccttctccga tcagaccatc aatgccaaca gcctcgttcg catacatcgg    540
acaatatccg tctgcaacaa ttcacataca cttggacatt cc                       582
```

(2) INFORMATION FOR SEQ ID NO:412

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 1365 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...1365

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:412

```
aggatccccg caaaagagtc ttcttcgttc gtggtgctga tggtaatatg ccaaagtgca     60
gttcactgac tatcaggatg cagaactcaa aaaaggagca tcactttcac ttatacatac    120
cccgttaaat aagttaagag ggaaatagaa aagtgtagta acaaagcagg ccctcatcgg    180
cctgcttttc tttagttaag tatatactcc catgcggcca accctccggc ccaacctacc    240
gacacatcgt atccggcaat atcgcacttg aggatatagt ggtgaccggt agcctacagc    300
ccgtctgctt aaagatgtac ctgtccccac aaaggtgttc aagccaaaga tatcaaagct    360
atagccccat cttctttcat tgacgtactg catatattct tcccgggatc gagtttacca    420
agcatggttc cagagatcag ccaatgctca gggatttgac gaaagttcta ttctcttcct    480
cgtcgatggc aattgatttc aacgggatct accagtggaa tagacttcga acgaatcaac    540
cggatgacat cgagcgaatc gaagtgcttc gtggagcttc ctctgcttgt acggatctaa    600
tgccatcgga ggtgttatca atatcatcac ccgtacacca aggatccttt tcgcgtatct    660
gcttcggctc gatacgatag tcgcgaggac agaaatacga tgtggcagca ggagtgaaac    720
gtgggatctt caccatcagt ccggcgtaca atatagagca gacaaaagtt atattttggc    780
ccgacagttc gagcaggaac tgaatgttgc aggcaatacg acatggaata taatcaagaa    840
gtttacaatc tctccgacgg aaaacttatc cttcaacctt acggactggt gaatctgcgt    900
aagcagcact ggacggataa gatcgatttt cgtacaactc ctacgatgtc aaagccggtg    960
ccaactggcg tatcagcgag cttcggatct ggacgtctct tatcattacg acaaatatag   1020
ccgtgatact gtctgatcaa gactgagaac caaaagaaac ttcccatttt cgatgaggta   1080
tgcaccattt gcgagcacaa tacaatctca atcttgctga agtccacttc tcaatgtggg   1140
tctggagtat atccatgata atgtagcatc gccccgcttt cctctccgaa cgaccggggg   1200
gaaaagtccg tgaacaacaa aatccatacg gacagtacat atataaagtt acccccaaac   1260
tcgtattgag ctatgaaggc gcttggacaa gcactccgga ttcggcttgt actatacatc   1320
gcgctgtctg ccatgttcaa gtgcagccat gtcaccaatc gcttg                   1365
```

(2) INFORMATION FOR SEQ ID NO:413

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 449 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
    (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...449

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:413

```
gtcgaaaatt cggaaaactt tacacaaaac gcaaaaacaa taacacacta taataagtgt      60
ttttatgaaa agttttcgga aaacttttca acaacgaacc ttttcctatt gtccaattaa     120
tatatacttc ataacattgc aggcacaaca gaagttattt acataaaaca ccatgtcacg     180
caaaacgtac acattcacga ggcatacaaa gcctcgcttg cctattttga tggcgatgag     240
cttgcgccaa agtatgggta atgaagtatg cgctgaaaga tgcccaaggg aatactacga     300
aaaaagccct atggacatgc acaagcgtat agcctccgaa atactcgcat cgagaaaaag     360
tatcccaatc ctctttccga ataagagctg ttgatctctt cgatcacttc cgctacatct     420
gtgcctcagg gaagtccgga taccggtat                                       449
```


(2) INFORMATION FOR SEQ ID NO:414

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 449 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...449

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:414

```
ggcgtaatgc ctgatgtcca tggactctcg gcacaggatg ctttgtacag ctacagctct      60
cagggttgaa agtaaggacg aacggatggg gacatgtatg gctcagtccg ttccgtacgg     120
ctctaaagtg aaagtggggc agactgtgtc atagacttat ctatgtaaag aacaaggaat     180
gggaatgaaa ctcgaaaata tctctcggaa ctgcggccga tagctgtcat tggcaatatc     240
gaacagaagt atcagatatt gcatctgatt ctcgcaaggc tacggacggt gcaccttcgt     300
agccgttcgt ggaacactga cagatgggca cagatacata ccgaagcata cacacaaggc     360
tgtcgcgcct ttgtcgtgga ggaccttccc gagaaaagcc ggaaggatgc tgttttgtcc     420
aagtgtcgga tacagccgaa gatttgctt                                       449
```


(2) INFORMATION FOR SEQ ID NO:415

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 1086 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:

(A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...1086

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:415

```
ggaatacgtg tcggcagatg gagaggaggg gtatccgggc gagctggtct tcggatcatt      60
tacagcgtca cggatgaggg cgcattgcac atagactacg tgctactgcg gatgctccta     120
cggttctgaa tctgaccaat cactcctttt caatctctcg ggtgcaggcg atccctccgt     180
gcatgatcat accctctgat acaagcccgg cattatctcc ccacagacga tacggccatc     240
ccttaggcga gcctgccgag gtcgagggga cgccgttcga tttcctcacg cctccggcat     300
aggggatcgg atcgacagtg cgatggatca gctcatttgg gcaagggata cgatcatacc     360
tttatcgtgg acaagccgtc gggggcatat ggttttgcgg ccgttgcgta tcgcccaaga     420
ccggaatcgt attggatgtc tttccaccga accgggtatg caggtgtaca cgggcaactg     480
gatgagcgga agctgagggg gaagtccgat cggcgttatc cggctcgctc ggccgtttgt     540
tcgagacgca gcactatccc gattcgccga acaaaccgaa ttatcctaga ccctcttgcg     600
cccgggcgaa gtgttcgagt cccggacggc gttccgatcg gtatcgtcga gtgatcttct     660
cacaaggatt ttgtatcaaa ccaatctaaa caagcagaaa ttatggaatt agacttcgta     720
aggagtagat tcatcagcac tttgacggat ctacgggtca gatcttcact tctcccgggc     780
gcataatctg atcggcgaac acacggacta caacggcggt ttcgtcttcc ccgtgctata     840
gacaagggcg tcatggccga aataaaaccg aatggttcgg acaggtaagg gcatattcga     900
tcgacctcaa ggactatgtg gagttcgggc tgggccggac gatgctcccc gtaccacttg     960
ggcaaagtat atctatggcg ttgtcgcgag atgatagccc gaggcgtaga ggtaaaggga    1020
ttcaatacgc cttctccggg gatattccgc tcggagccgg catgtcctct tcggcagctt    1080
ggaaag                                                                1086
```

(2) INFORMATION FOR SEQ ID NO:416

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 480 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...480

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:416

```
gaagaggaag ctttcgatct gggacataaa gctgtgagag aacgtttcgc tctttcgtgg      60
aagatgccaa acgattaggg cgagccatcc gcatcggatc aatcatggct ctctgtccga     120
acgtatgctt acgcgctatg gcgatacgct gaaggcatgg tacaaagctg catggaatac     180
ctcgatgtat gccacgacat gagttcgacg atgtggtgat ctcgatgaaa gcatcgaata     240
ctttgtcatg acagcagctg tacgccttct tgtggaacga atggatgctg cagaatgcac     300
tatccgcttc acatcggtgt caccgaggct ggcgatggtg aggcgggcgg atcaagagtg     360
ctgtcggcat aggttcgctt ttggctgatg gcttggcgat accattcgtg tttcactgag     420
tgaggatccg gagcatgaga tccggtagcc cgcaaattgc ttgcctatat agagaaacgt     480
```

(2) INFORMATION FOR SEQ ID NO:417

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 773 base pairs
        (B) TYPE: nucleic acid

```
        (C)  STRANDEDNESS: double
        (D)  TOPOLOGY: circular

    (ii)  MOLECULE TYPE: DNA (genomic)

   (iii)  HYPOTHETICAL: NO

    (iv)  ANTI-SENSE: UNKNOWN

    (vi)  ORIGINAL SOURCE:
        (A)  ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix)  FEATURE:
        (A)  NAME/KEY: misc_feature
        (B)  LOCATION 1...773

    (xi)  SEQUENCE DESCRIPTION: SEQ ID NO:417
```

```
gtaggcaggg gaattttggc ccgatccggc acgggcacgg caccggcatt tgtctgaacg       60
cttgtttttag ctgctataga cgagctcgaaa agaggagttt ggttcaagga ggattgtcgc      120
gtatggatgt atcgcggagc ttgggcaagt gggaaataga ctacatagag atggccgtcc       180
cgatgagtcc ggacgactcc gcttcaaacg aaacagcatc ctcaagcatc agtcgcaaat       240
ggagtcgccc ccttccttgg cgatgacgaa cggctcttct ggcagagggc ggaaatcgga       300
acagacaaac ggccaccctg tacgaaaaac tcggcttggc ctctatgaag ccatagaggc       360
attcgtacag tataggcctg tcgaatagag aacggtataa atacaataag agaggcttcc       420
ttcacttgtc cattcgggac gagaaggaag cctctttatt ttggtaccga cctttgccaa       480
cggcaggcgg gtttatctcc gggcgagctg atgatcgatg aagatcagat tctgctccta       540
gagagacgga tcgtttcgac gatttcggca gcagtggctt cctcttctcc tgctcgcgga       600
tatacttcca gaagaagtcc tgtgatgcca tatctccgct tcggaagcag cccttacgac       660
agcctcgatc atttcggtca ctttgcctcg tgttcgtaca cctgttggaa tacctccaat       720
acagagcccg aactttgggg cacggcatcg atagcttcta tcttcacctc gcc              773
```

```
(2)  INFORMATION FOR SEQ ID NO:418

        (i)  SEQUENCE CHARACTERISTICS:
            (A)  LENGTH: 5489 base pairs
            (B)  TYPE: nucleic acid
            (C)  STRANDEDNESS: double
            (D)  TOPOLOGY: circular

    (ii)  MOLECULE TYPE: DNA (genomic)

   (iii)  HYPOTHETICAL: NO

    (iv)  ANTI-SENSE: UNKNOWN

    (vi)  ORIGINAL SOURCE:
        (A)  ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix)  FEATURE:
        (A)  NAME/KEY: misc_feature
        (B)  LOCATION 1...5489

    (xi)  SEQUENCE DESCRIPTION: SEQ ID NO:418
```

```
cagcctgacg gatactactt acgaattaca aatcccttct actttgaatg gcacagaagc       60
accacttgaa tctggaattt cgtcttattt ccgagcctag cgtgctcacg gacatttcaa      120
ttacgctgtg tttgtggatg gccatcgatc ggtagcggaa tcggcatgaa taagaaagaa      180
gctcatcaga atgctgacat gatgccctgg aaaagttgaa gcgtgcgcgc gattaccgac      240
aaaaaagaaa tcgtcatcat cttcggagcc ggaataaaga ctcgcactct gcaccaataa      300
cttgtgctgc attttcttat tgtattttca gaaaaagaag caacccaatg acactccact      360
ttgtgtcgtt ggggttgttg ctttagaagt aatgatcaga ttatttctta gctgctttgt      420
tgagcttgcg cttttggatc tgtaggcaag gggtgtagca acaaagagcg tagagtatgt      480
accgataacg taccgagcag gatcgagaac gtgaaactac gcatcgtagc acctccaaaa      540
tgaagattac caacataacg ataaacgtag tcaaagacgt atttaatgtc gacccaatgt      600
tgaattaagg gcatcgttga tcacctgata gcgatcttgt tggggtacaa tttcatcgtc      660
tctcggatac ggtcaaatac aaccacgtgt cattgagcga gtaaccgatg atagccagaa      720
```

```
tagcagcgat gaagtctgat cgatctccat ggtgaagggc agaatcttcc acagcaacgc    780
atacgagcaa taatgcagaa tgtagtagcg gccacagata cgaatacccc ggcgagaaag    840
aaatgtcacg gaagcgaatc agaatataaa tggccatgaa gacatcgata acagcacagc    900
ccaaatagca cctctcgtga tgtcactcga ctactgggac ttactttctg agagctaatg    960
atattgtcca agaactgatc gcagtaggct gctgggtgta gaaacctttc aggctctgat   1020
acaatttgta gtaatctctg cttcagtttc ttcgctttcc tcctggatct tatagttcta   1080
gatatacgca cctctgtccc ttcagtaccg atggaggtaa ccaatacttt tcctgcaggg   1140
gagaagacaa ggccgaacga acggcttcgg aagataaggc tggtcgaatt taactacgta   1200
gttacgtcct ccggagaatt caatacccta ttgagaccga ttgtaaatga agctataagt   1260
cccaaaacga tgatatcacc ggaatgataa agccggtctt gcgcttaccc aagatgttgt   1320
atggggattg acaaggagat tgcgagtaat gctcgtagtg aatgtaatct taccaaacga   1380
ccttttttcg ccagtttctc gaagacgata cgagtcaaga aacagccgta atgaaagaag   1440
cgataagacc gataatcaac gtagtggcaa accgcgaatc ggccccgtcc cgtagaggaa   1500
taggatgata ccggtaatat agtcgtaacg ttcgagtcga agatggcaga gaaagcgttg   1560
ccataacctc cgtaacggca cgaatcggag tcttaccggc acgaagctct tctttgaacg   1620
ctcgaagata agtacgttgg catccacagc catacccagc gtcagcccaa acctgcgata   1680
cccgagaggg tcagcacggc atggaaagaa gccaaacgcc caatgtgaag aagctgttta   1740
caatcaatgc gccgtttgcg ataaacccgg caagaaaccg taagccagac acatgtaaca   1800
catcaggata accaagcgag caggaacgac aagaatccgg ctttaatgga ctcggcaccc   1860
aggtaggacc aatcacgttt tcctgttcga tgcttaccgt agcatccatt taccggagtt   1920
gagtacgttg gcaaggtcac cggcctcctc cacggtgaag gcccggagat ctgagagcga   1980
ccgccgtga tctcatcatt cacgttcggg cagaataaac cacaccatcc aaaacgatag   2040
cgattgcccg tcccacgtat cctttgtgat acgcgcccat ttacgagcac cttcttcatt   2100
catcgtctcg aaacgatcgg ttcggaacga ccgaagtcat tttggatatc actcttgcgg   2160
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aaaagcacat cttcacgtgt aacttcagat cgtgagcttg ctggagcatt tcagatatct   2340
gagccatatt agacgacgag ccacacccac tactgcaccg ccacgattca cgggagtaag   2400
cgagagaaga gtgcgtcttt acgagtagca tccttggcct ctttttgtgc acagtagcag   2460
aatcagctac agcttgtaca gcagcagaat cggctgttga gctacagagt cagtagttgc   2520
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gcagcgatca agtctccctg acctcttcga atttgtatgt acgccagaac tgtaggttgg   2640
cactgcttgc aaaagggtac gaacacgctc agggtctttc actccgggga gttcgcaagg   2700
atacgccctt gcccttccaa tcgctgcaaa ttaggtgcaa ccacccgaaa gcatcgatac   2760
gagcacggag cacattgaac gaagcttcta cagactatta tattttttctt tgagcagacg   2820
cactacgtct gcatccgtag acttgcggta atctggtcgc gaaggtcacc cgaaccgaag   2880
ataacggcca acgaccgttg ggatcgagct tgcgatattc cttcacgaaa atatcgatga   2940
gtcggattgc tccgtgctct tggcagcatt ctccagagct ttgttgaagt gggatccaaa   3000
cttttgttag agaggttacg aagcagatcg cttgcgttag tttcaagata acgttcatac   3060
cccccttttaa gtcaaggcca agaccaattg ctgggcttga gcttctttca gcgtgtagcc   3120
gaaccagacc ttctcatcga catggaatca agataggcca ttccggcaac atcgcccatc   3180
gccttgcctt cttttcgtaa cggttcgtaa cgaaagagaa tgacaggtaa aacgacagat   3240
gatggccaga gccgatgtga taacaatcac aaatcctttg tttgcatttt gtctgttact   3300
tatttttattg ttagattttt ttcatctata cagcatattc ataggggcgca aagttacgtt   3360
ttttttttaca ctatctctca cttatatata gaaaatagct gatgattcgg gtcatcggca   3420
gcaaaaacag gggacattgc ctcggtacag caaatgattg ggtggctcta taaccaagac   3480
cacagcaagg atactgcagc ctacccactt ccgagctgct ttaagagcat ttttcgaaag   3540
cgatatatgg caaaggcttc tgcttcatat ggaaagacaa acctgccggt agccaaggcg   3600
acggaaaagg ctctgcgcag ccgtatgggg ctatacgtat ctatgcgtat gcaagtgccc   3660
ccttgttcgc gagcttcgtc tcggcagaga aaagcatggc agcggcatac cccttgcgga   3720
gcaggaggaa tgaacaccca ggcggtgtat cgtataggct ttcccttcgg tctccatggc   3780
aacgagccgt attcggccgg catctgatca ttcacagcca tcccccaaa ggagtacccg   3840
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agggcaagat gctgtcgtaa tcggatggaa gagcccgacg gatccgataa tgatcagtga   4020
gagacaatat cctgtctgct tgctgtccaa tgctttctct gtcatgtaaa tcaataagat   4080
ggttgcaccg tctttgtgcc tttgggatac agtctgtgca cgagtgcttc agccgattcg   4140
tccaaatagc tgttcggttc atcgatacga ggagttcggg acagcttacg atagctctgg   4200
ccaaaaggac acgcgtagct gtccgccgct caaatccgat atggggcgtt tgagcagatc   4260
ggtatccgga gatcggaggc agcaccggcc agaagttctt tgtgcgaacc tcattaccct   4320
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attgagctga ggcagataac cgatcgaagg cttacacacg gcattccctc ccgattgtag   4440
aacgtaagac tccccgatcc agtggcagca ggccgattat tgcctttacg agggtggact   4500
ttccccaca ttgcgtccta cgataccgag aaattcgcca cgaacgatat cgagcgatag   4560
tccttgaata cattttttcgg tccatagccg aacgaggccg acttcagctg agcaataagc   4620
taccgttcat gagccaaagc gcgagcaata tgtaaatttc ctcctcccac gagctgcgca   4680
gaggattgat ccttaccgga cgagaccgat ctcgcgtgcg atgtcctccg cctgacgcgt   4740
ttcaaattcg ggtggataaa tacgattctg acaccatcgg cacgtgcctg atcgatcaca   4800
```

```
cgcgaaggtg ggcagccgta ggctctttcc catcttcctc tatgacgatc tccgcaggcc    4860
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ccattggcaa acatggtatc gacgagtctt tcacgctgtc gatacgtccg ttgagacggt    4980
cgtgcccttt gtcccattgt ctttctcgtt cggataaagc tccacaagcg cgtcgtatgc    5040
agcacgatga gtgcctttgc ccctaccaca ctgctccaat agtgcggatc atgggctgca    5100
ggtctgtatg agaatgatct gtgcaggagc cgtggagatc tgcactccgg catccgccaa    5160
ggctttgccc atttcgaaaa gagggagctt agggtattgt cccgaatggc agcgagattt    5220
ctttgctcga accccagtcc tccatataga agtaggcatc tgcttcggac aaacgcttca    5280
tcacggtagg cgagggtcgt attcctccgg attgctgccg gccggtacca atgccaccac    5340
cgcaccgact tatccgcaat ggactcgatg aagtatttct gtggctcgat gtcacagcca    5400
gcgtacgatc ggagcctgaa gcagtacccc ctccacaagc ggcaaagcag tagcggcgag    5460
gatgaaggcc gggaaaatcg taaaaaaag                                      5489
```

(2) INFORMATION FOR SEQ ID NO:419

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 664 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...664

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:419

```
cagcagttcc cggtagtaga aaccatcacc agcataatgc tcagccgaaa accagcatct      60
tgcgcactta cccaatactt gacaagcttg gctccttcag tctgggtgta accaaatagt     120
tatccggagt taaaacgcca atcatcgtaa gtacgaaggg gatgcaatac acttctcact     180
gtcatgtcca tacatatcca aggataatag tcccaattaa cattgtcgcc atcagcatca     240
atcaaaacca gccttcagga atacttccgg cctcaaagcc ttcatataag ataagtccga     300
ttgagaatca taaatcagct tatcgcaaac cgattgggac tcgtattgtc gttataaacg     360
gcagtgacac aatattccac ttccacctga tctctcgtga agaataagtc tcatcgatat     420
actccaaaac agtcgggtct ttatgtgaac aaggagcgag ccgtttgcat agatattgta     480
gccggcaagc gcaatgggtc tttatcatca gtcttatcgg gttcgtaagc cgttaggata     540
ttccacttta atcgtccctt gttgttttca ataagcgaga caacgaaacg gtaacaggtt     600
cgggctctga tgcaggagtc ccgaatccag gtgatatgtc caacttcaag aaatattata     660
tcgg                                                                 664
```

(2) INFORMATION FOR SEQ ID NO:420

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 567 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...567

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:420

```
ccccgtaaag cagtgatcgc atcggaatca gccaagaaag tattggctgg aacctgagac      60
aacgcgctca caaaatcgct cagatcaaga aagaggctaa gaaaaagctg catcaatgca     120
gggcatcagc ctgacgatca aggccaaaca agcagcacgg gcacaatctt cggatcggta     180
acgaatatcc agatcgagaa gagctggcga aaaaaggcgt ggaagtggat cgtaagatca     240
tcgtctcaag cctgccgtta aggaagtggg caactatacg gctgtagtgc gcctcacaag     300
gaagttactg tagaaattcc cttcgaagta gtttctgaaa atgaactatc atagaagcaa     360
agccggaaga agctcctgtt cccgtagcgg aaagccgacc gctgagacag aacaagcaga     420
agttgctgct tgaataagca cctgagattg ttccttttta gcctgtcctc caatgcttgg     480
atggacatgg taaaggaata acagctttgt cagcattcag aataaaacga tatgagaagt     540
ggaccaaaac gcatagtttt ggctcac                                       567
```

(2) INFORMATION FOR SEQ ID NO:421

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 433 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...433

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:421

```
gcctttgctc tacggccaat aataatgtgg gcgaagaagc ctacgacgac aaaaaaagac      60
cgatcatcaa gcttttgtcg ctgatcgaat tcgtgaatcg gggatggcca gtaccaaaac     120
gccaacgagc aatatgatgg ctcccaatat tttccgattc cttccattgt gagtatgttc     180
gtttttatttg ttttcgtttt atctctgcaa ataaacaat aatctgccga atacagaaat     240
tattgacgaa agattcatta cttttgtccg taatcaatac gaaaaagatg aatatatcgg     300
acgctttctt tttctcatct atttctgcct gatcggcgcc ccttttttcct cctgctcact     360
atattgacag cactgactac cactgtaggc tgatgctggg gaggcaagta agaatattca     420
agttaattaa tcc                                                       433
```

(2) INFORMATION FOR SEQ ID NO:422

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 730 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

```
    (ix)  FEATURE:
          (A)  NAME/KEY: misc_feature
          (B)  LOCATION 1...730

    (xi)  SEQUENCE DESCRIPTION: SEQ ID NO:422

aaagcgtacc gtttcagcac cgccgaacca cacggcaatc tgccgacgcc atcgccctgc        60
tttacatccg ccgtttttcaa aacgttctcc gcatgtgttc gtgccgactt ctccggtttc       120
cgctcggtat caagccgtat ttccgctcag ctcatcgggt gatccgtttg ctgcgtcttg       180
cttcgaactt gtaaggagct ttttcccgta gctgtccaca cgcagggaga cgatatggat       240
atgctgcgcg cgatgtcgtt gtgcttgaat acgatgtaag gctgtttgcc gtatccatct       300
tttccatgta ttcccgggcg atgtcctgta actgctccgt tgtagcctgt cgtccggatg       360
cggattgagg gaacagtgaa acaccgtctt ttcgtgcgga tacccgacgg gatgcgcata       420
tccatatcgg tcaatgctcg tcaaagttcg tttctccgtt tgcatccacg ctcatcgagg       480
aggtcagaat acggaggcgt ttcccgccgt tactttggaa aagttatatc ccaacactta       540
cccatgcttt tcggagcggt tatctcggca accatcgttc ttcgaaagta ctgtgagccc       600
ggttcgttct tccagaagcg caaggagttc tccggtgatt gctccagctt tgcagcaaaa       660
cggccgccgt tttgacggaa tggtactgta atggagcgga cggcctgatg tagagcacgc       720
caaccttgcg                                                             730
```

```
(2)  INFORMATION FOR SEQ ID NO:423

    (i)  SEQUENCE CHARACTERISTICS:
          (A)  LENGTH: 364 base pairs
          (B)  TYPE: nucleic acid
          (C)  STRANDEDNESS: double
          (D)  TOPOLOGY: circular

   (ii)  MOLECULE TYPE: DNA (genomic)

  (iii)  HYPOTHETICAL: NO

   (iv)  ANTI-SENSE: UNKNOWN

   (vi)  ORIGINAL SOURCE:
          (A)  ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix)  FEATURE:
          (A)  NAME/KEY: misc_feature
          (B)  LOCATION 1...364

    (xi)  SEQUENCE DESCRIPTION: SEQ ID NO:423

cggctcgggg atattgacga aataaagcac tacaaaagcg agtgcaaaat acacatggcc        60
aggatgatag cgggataagc ctgcttgata ttggcctgtg aacgttgctc ccgataaagt       120
aacccacgag cacgggtacc agagtcgcat cagcgaattg aaagagccac ccacctggat       180
aagctggtta ccgcggtgcc tccgccaccc aaggtattga gcatcggatt gactaccgta       240
ttgagatac a catggagaaa ccggcaacaa atgcgccgac caaataaata gagagctacc       300
catctcttcg gacaagagct gtattcctat gcctacaaat ccgcagcgat ggcggataaa       360
agct                                                                   364
```

```
(2)  INFORMATION FOR SEQ ID NO:424

    (i)  SEQUENCE CHARACTERISTICS:
          (A)  LENGTH: 3297 base pairs
          (B)  TYPE: nucleic acid
          (C)  STRANDEDNESS: double
          (D)  TOPOLOGY: circular

   (ii)  MOLECULE TYPE: DNA (genomic)

  (iii)  HYPOTHETICAL: NO

   (iv)  ANTI-SENSE: UNKNOWN

   (vi)  ORIGINAL SOURCE:
```

(A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...3297

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:424

```
aaccaaatcg gcacctgttt cttccgcttt ggctatagcc atggcgagac tgcaggctct     60
tcgggattgg gagaatgtac cgtagggaag tctccgctac aacatcctgt tcgggtacgt    120
gaatgatatt ggcaaaacca tattcactaa ggcacggggt accaccgtac ttccggtacc    180
gtggataggc gtgtatcgat cttcatatcc cgatgacggg caatgctttc gggagaaaga    240
ctcaggcctt gacttcagca atgaaagccg aatcgatatt ctcacctatc atccaatcag    300
ctcgggcttg gcttcgaatt tgatctcatc aacggagcga atttattgac ctcggcaatg    360
atattacgat cgtgtggagc tataatctgt gcccgtcttc ccaataagcc ttatagccgt    420
tgtattcctt aggattgtgc gagctgtaat cattacaccg ctcttacatc ccagatgacg    480
aatggcgtaa atatttccgg tgtgggacga agttcctcaa acagataaac cccgatgcct    540
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gccaaattcg agctttggca cgtacttgat ccaataattt gttgtttcca taagtatttt    900
gtgtttctgc aatacgcaca aagataagtt tccgcaccgt tttccggtta gaaataaaac    960
agttaatcga acaaagtcga agaatgtcgg gcgtcttcaa cagagggaaa ggcggaaggt   1020
gaaagcgatg tagtccacca gataatccaa acctgtcttc gctcagctct cgaaagccaa   1080
agctttcata ttatcgaatg taatacgact aaagagctgt aaatatgcga ttgatcgggt   1140
ggaattcccc ttccatgagc aggagcattc ggtacgagcg accatcagca ggatcgaacc   1200
aacgcggaat aacacttcct ccgaatgtaa atcgggtatc aaccccaatg gaacaagcaa   1260
acgaaaaaga aaagcagatg aaaattagcc atcggcccgt ccatttcttc caacttatct   1320
atgaaaaagc cacaaaatca tacagattcg tatcggcttc cggcagtcgt aaatcagata   1380
aagaaattct gccagaaaga gtgctatact attccttacc gatcggactg aatacggcca   1440
tgcaaactgc atagtttggc ttctttgata agtgcaaatc gcggtgctgc ttgtgttcgg   1500
ccgtaatctc cagttcgtta gaggagaaat aagcaaacgc aagctaccgc cacttttccc   1560
tcgcttggtg aacgtggtat cagataggac actctgccac tctctctact gaaaagaggg   1620
ctatactata actatcgtta taagccgtat tgtggagaac tattgcctgc tgactataat   1680
catgactaac cgaagatcga tacaaatatc gtctatcagt cgtctgaaac aatcgttttc   1740
cacatagact gtcgataaac ctgtgaaaat tcgctgataa aaacttgttt attctcttgt   1800
ccgatccgaa agatcttcat ataaaattat tcttctgcaa agacaaaaaa gttagcagca   1860
aatctcatca acttttgcca aggattactc acagctcggc acaaaaacaa aagaccgaat   1920
tgaccgtaga aacaaaagtt ttccacattc cgatggaaac cattggctat cagcattcaa   1980
cgaagtgtat aacctgttag taagctatcg tatctattcc aaatctgtta atcccctacc   2040
ctattcaccg agtagttaaa gccttatcaa cagtttcaac cgacctcctt cttcctatat   2100
attttttttt tcaaaaagga atatataata aaaagaaaat cggttgccca cctgttaaag   2160
gtgaagcaac cgatcgtgtc acagatatag aaaagtagct atgaatttat ttgatcagta   2220
gccggattat cggttgtggg atcagaaatt gatcttgtac cgacgaaaat ccttctgggc   2280
tgcataggac cgtatacgta agtgaagctc tacccggtcc cttgtccgtg tctttctgat   2340
agctgttgaa tagttctgta ttccggcatt caattccaag gtcatagtgg aagcaaggtg   2400
gagtcgtggc tcagcttgag gtctatatcg gcgaaggccg gagtcttgac agcttggcat   2460
gaccttcggc caaacctttg aattgctgac cattcattta aagtcgaacg atccgtccgg   2520
agctatgtgt tctgcgggaa tatcgcctca taggcttcgt gtactacatc cattttgccc   2580
gtgaatgtac cggagagttg atggcgaagt gctcggtagg acgtaccgta gcaacgaaat   2640
agccgtcaga ttcggagtgc gtacatagtc tttcacagag atctcggctt gtcccttgtt   2700
ttgtccgctt ccacagcggt atagatgctt ccgtagcggc ttcttgccat gtaccgccga   2760
gctggaggtc gaacgatttg ttgtaggcga ttctccctcc agattcacac catatacctt   2820
cgatactcca tccttgtcgt tgagatggta cgaatgatcc attctttgcc atcgctcgtg   2880
gtttcgacct ttcggatggt ttgaactgat tgctgataaa ggtggagaag cttctccca   2940
gatattgaat tgccattcgt cggctctgtg gtaataatcg aaagaagcat gatgcttcgt   3000
gaacgttctt ctttcagatt gggggaaagg acacggctat aggagtacca ccggccaact   3060
ctacgtgcag atcttcatcg aaatactagg agcgcggaat ccttcgctgt atgagagtcg   3120
gaagctgaga ttcttatggg attgtatcgt acgttggctc taggactgaa aatgaagagc   3180
ggatcatata gcgtttgcca tcctgattga ggagaacata gtcgatacgt gctcgataag   3240
ggcacttaac ttctccgtct tatattcgag ctggtcgtac tgataaaagt agaggta      3297
```

(2) INFORMATION FOR SEQ ID NO:425

(i) SEQUENCE CHARACTERISTICS:

```
        (A)  LENGTH: 1166 base pairs
        (B)  TYPE: nucleic acid
        (C)  STRANDEDNESS: double
        (D)  TOPOLOGY: circular

   (ii)  MOLECULE TYPE: DNA (genomic)

  (iii)  HYPOTHETICAL: NO

   (iv)  ANTI-SENSE: UNKNOWN

   (vi)  ORIGINAL SOURCE:
        (A)  ORGANISM: PORYPHYROMONAS GINGIVALIS

   (ix)  FEATURE:
        (A)  NAME/KEY: misc_feature
        (B)  LOCATION 1...1166

   (xi)  SEQUENCE DESCRIPTION: SEQ ID NO:425
```

```
gggattttca ttgaactctt ttgctgcaga gcagattctt agtgtcttcg gaaaggtcaa     60
acctccggta tatgggcacc gagcaaatag aaatttcaca agtttccatc agagaagtat    120
tcctttcctc gtcaaatcaa tgcttgtccg ataggcgaga aataaggaat gattgtcggc    180
tgtttcttgc tccctgatga tgcaggacgc gattgtcagc tgattcttgc ttcctgcacg    240
atgcagacgc gattgtcaac tgattcttgc ttcctgcacg atgcaggacg cgatgtcaac    300
tgattcttgc ttcctgcacg atgcaggacg cgattgtcaa ctgttcttgc ttcctgcacg    360
atgcaggacg cgattgtcaa ctgattcttg ctcctgcacg atgcaggacg cgattgtcgg    420
ctgtttcttg cttcctgcac gtgcaggacg cgattgtcaa ctgattcttg cttcctgcac    480
gatgcaggac cgattgtcaa ctgattcttg ctccctgcac gatgcaggac gcgattgtcg    540
ctgattcttg ctccctgcac gatgcaggac gcgattgtca actgattctg cttcctgcac    600
gatgcaggac gcgattgtca gctgattctt gcttcctcac gatgcaggac gcgattgtca    660
gctgattctt gcttcctgca caatgcggac gcgattgtca gctgattctt gcttcctgca    720
caatgcagga cgcgatgtca gctgattctt gcttcctgca cgatgcagga cgcgattgtc    780
aactattctt gctccctgca cgatgcagga cgcgattgtc agctgattct gctccatcaa    840
tgcgctaact atcagctgtt tgcaactatt ttataggact ttattgaagt cttttgccgc    900
agagctgatt cttaagtgtt tttcagatta ctgaggtttg cagagagatc gcatgaagct    960
ctcctttctt cgtcaaatca tgcttgtgtc tgtcttgatc aatatgagag ggggagaggg   1020
ttattgtgca cagtctcttt aataataaat tgtatttctc gtttattcat tggtttagta   1080
gtattttgc gctatcatga gattatcaga attacatacg ggcgatcagc agtaatcgta   1140
cgagtagaag gtcgcggggt accccg                                        1166
```

```
(2)  INFORMATION FOR SEQ ID NO:426

     (i)  SEQUENCE CHARACTERISTICS:
        (A)  LENGTH: 730 base pairs
        (B)  TYPE: nucleic acid
        (C)  STRANDEDNESS: double
        (D)  TOPOLOGY: circular

    (ii)  MOLECULE TYPE: DNA (genomic)

   (iii)  HYPOTHETICAL: NO

    (iv)  ANTI-SENSE: UNKNOWN

    (vi)  ORIGINAL SOURCE:
        (A)  ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix)  FEATURE:
        (A)  NAME/KEY: misc_feature
        (B)  LOCATION 1...730

    (xi)  SEQUENCE DESCRIPTION: SEQ ID NO:426
```

```
cgcacaantt ttcagcttaa atgtttcttt cagatagatg atctcgccgt ggtcaagaga     60
tgatcaggcc ccaaactgga acccgaaagt gtatagatcg gaccttaccg ttagtgacgg    120
taggagtaag atcggcatag gtgccggagc acccagttta gcctgaagcg tcatcgcccc    180
```

```
caccccctgtg aggtagcttc atcgggatac tctatcgaaa gataaactgt ctgggtcggg        240
ttctggaacc attggttata gaaaactctc gtacgatggt ctccccaatc tgctgttcac         300
ttgcggcgca ggctgtttga tcgtcaggtt cggatagttt accaatagga gtttgattcc         360
ttgctatcac tatgatcgcc gatagtcacc gtaccttgtc tttgaagaca aaacccgttt         420
cggcagcatt aatggcattg cccatgcggt acagacagct ctcctcttaa tcgtcagctt         480
aacgatggtt caagctctac cacattgttt ccatccgccg attttaccgt aaatacaggt        540
cgttcggatt agaaacattg gtttccgcca ccgtcactgc attgcccttg taacacttac         600
gacagccgtt ccgaccacat actcgacacc gncggcagtt tcacattaac tttgatacca         660
ttcgaatcct nctggactac agtnaatcaa tgatcaatgg ctcttctnca gaacatacag         720
caatggacna                                                                730
```

(2) INFORMATION FOR SEQ ID NO:427

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 1008 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...1008

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:427

```
tagaggatcc ccgcgactat gtttctttcg gtttggcggt agaagatggc gtttgacaaa         60
cgccggattg ctttttgccg accaatgtcc gttacctgca gcagagtctt ctgtacacgc        120
tggaatgggt tgcaaagagg atcagtgatg aagatgcgac ggatgatgca gaatacagtg        180
gcaatctgat atactttta aaaagtgccac tgagtttatt cgcagaaata cccgcaaagg        240
atggataaaa cagctaatgg aagagtggag aaacccgact atgccgaacg tgctattttg        300
agggagtggt gaacgctctt atccatagga catatgattt tcggggactg aagttcatgt        360
gaaaatgtat gacgaccgtt tagttatctc attcccgggg gaatctatgg agggggagaa        420
ttggagccca tgagcgacgg ccttatattt ctaaaaggcg taatccgata ttagctgaca        480
ttttcagccg ctaaggtata tggagcgtcg gggaagcggg ataaagaaaa tctttgaaga        540
acgaagaatc tttatggcta tacggaagaa aaaaagccgt ttttcctttg aataaacaga        600
atgacttctt cctgacgatt ccgaacgtta attatcgtct gagtctgtta ccacacatga        660
caccatacat gacaccatac atgacacata catgacacca tacatgataa aatcgccttg        720
ttactttcct tctgtaaacg cctcgcagca gagaagagat gatggagttt gtgggtttaa        780
gaaacgcgat cattttcaga agaaatacct ccgtccttta ttagaacagg aaagatcgaa        840
atgaccattc ctgaaaagcc ccaaagtaag aaccagaagt atgaacgaag gaggtagtca        900
aataacatat ccattctcta atataagcgt taacaaattg agtttttata agaaatatct        960
tcctgtgggt atgaaagagg ggtgactcat tgtctggatt ctttcgtg                    1008
```

(2) INFORMATION FOR SEQ ID NO:428

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 768 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
    (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...768

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:428

```
atccccggcc gtacacggct ctaatccggt accccccttat gcctatgtac ctcatatctg    60
tggacacaga aagcattcaa agcggatgtg atgatgcatt cggcacgcat ggcagccttg   120
agtttatccc gggcaagcag atcgcacctc ttctgaggat tggacagacc gcctcgtcaa   180
tgacctgcct catatcacta ctataccatc gccaatatcg gtgaaggaat gatcgccaag   240
cgcagagcta tgccggtacg gtatcttatc tggctcctcc tttcatcgaa acgccatgag   300
gggtcaagta agcgagttcc tcagcttgac ggataaaatac ctgagcagga caacgatgat   360
aaagccctgt ctctccgcat caaggctttg gcgtgaagaa cggctaccat cgggatctga   420
aactcgactc catccttgac aaccttatac acgtgagcaa atcatctctc tttccgactt   480
tgccgaagaa ttgctgtcag caagatcccg ggtggtatgt acaagacagg cgttatgttc   540
cggaagaaaa gatccgctct tccgtgaagc atattgctac agatcctatg cttatgcttt   600
ggccgctatc gaccgtcagc gtggacgcta cacacagagc agcaagatag cgaacgattc   660
tttaccaacc actatcgtcg tcctgcgaag cactggtaga gcgttacctt ggacgcnagg   720
cggtagatgt gaatgagcat tgactacgct gggtgtactg tccagcga               768
```

(2) INFORMATION FOR SEQ ID NO:429

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 3453 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

  (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...3453

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:429

```
tcaaaaaaca aattcattgg tgttttctta acgtcgaact gacgttctan ggaataccgc    60
tatgctcctt gtggtatagt tagtcgtcag ttcgatccga cccaacttcc ctatttgcgc   120
ttagatcgaa ctggcatctc tgatcttatg cggtaaaatc tgccacttcg ataaattacg   180
aaccgaaaaa gctcggttgt ggtctgtaaa tccagagaaa acggcgcgag aatttttttcg   240
ctttgcgcgt aaaatttta cctcccgaac caaaacgtaa aaaatcacac gccatctttc   300
atggctgtaa agccggcaat ttttggagcc taaaccatcg cgggagaggg agtagcgatg   360
tgtactttct cggacttccg agtacagatt cagcactgta ttgagcaggt tgccccggtg   420
tctcaggtat tggttgtctt aggcgaaaac gccgattgcg tggcattaag tcaccggctc   480
ttagcagtcg cataacctat accgaccgat cgaaacctct ctccgaagca ctgcttactt   540
attaatgaat aactctctaa agccggcttt cggtaggctt tctttgcact gaggtactga   600
taataatgga ctatactcgt atttaatgtc agttcgacta agcgcaaata ggggagttgg   660
gtctggatcg aactgacgtt atagttaggc aataaggttt gcgacatcct cgtttagttt   720
aggaacagca atatggcatt atgcttacct ttgctcatca aggagccgca accgcatggc   780
tgtagcttcg gatgcatttc caataataca catacgacaa acaaatgaac ttttagaaga   840
actgcgttgg cggggtatga tccacgatat tatgcccggt acgaggaaca cttgaacaag   900
ggtatgacct cggcatacgt aggcattgac ccacggctga ttcgttgcac atcggccacc   960
tcgtgggtgt gatgatgctg gccatttcca gcgtgccggc catcggccca tcgctcttat  1020
aggtggtgca cgggaatgat aggggatcct tcgatgaagt cggccgaacg agttctctgg  1080
acgaagccac tcttcggcat aatcaggact gcatcaagca gcaactgcca agttcctcga  1140
tttcgatagc gatgcaccca atgccgcaaa gctcgtaaca attacgattg gatgaaggac  1200
tattctttcc tcggtttcat tcgggcatcg gcaagcatat taccgtcaat tatatgatgg  1260
```

```
caaaggattc tgtgagaaac gccttagtgc cgagagcagc accggtctgt cctttacgga   1320
atttcctacc agcttctgca aggctacgac tatctctatc tatatcggaa tggggctgcc   1380
gcttgcagat gggcggttcg gatcagtggg gcaacattac cccggaacgg agcttatcag   1440
acgcaaggac ggaggagagg cctttgccct acttgtccgc ttattaccaa agccgacggt   1500
ggcaagtttg gaaaaacggg agcggcaaca tctggctcga tcctgccaga acttctcctt   1560
atgccttcac cagttctggc tcaatgtgag cgatgccgat gccgaaaaag tatatcagat   1620
cttcacggga ctgaatcagg acgagatagc agaactggca agtcgtaggc cgaggctccg   1680
catctacgcc ccttgcagaa gagattggca gaagaatcac cgtcatggta cacagtcgtg   1740
aagcctacga tgctgctgtc gaagcagcga gatcctcttt ggcaagagta cgacagagca   1800
attgcgcaag cttacgaggc cactctcctc gatgtctttg ccggtgtgcc gcagtatcat   1860
gtgagcgcag caggatagcc acaggaattt cattggtcga tttgctggcc gtgctaccga   1920
tatattcccg tccaaaggtg aattgcgcaa gacggtgaaa ccggcggagt gagcctgaac   1980
aaagagaaag tagccgatgc ggaacaaacg taggagagga cgacctcttg tccgaccgct   2040
atctgctggc gcaaaaagca agaaaagcta ttacctgatc atcgtggagt gaacacacgg   2100
atagcgcttc atgaaactat ccatcgttat tgtcaattat cgtgttccgt atttctggaa   2160
cagtgccttc tctccgtgcg aaagtctgcc caagggattg atacgaagtg tgggtcgtag   2220
acaataattc gggggatggt tcggtagaat atctcaaagt cgtttccccg aagttcattt   2280
tgtagctaac gaggagaatg tagtttctct cgcgccaaca atcaggctat ccgtctcagt   2340
aaggggcaat actactcttg ctcaatcccg ataccttat cggagagagt acgctgcgta    2400
cgtggtggac tttatggatt cgaagcctaa tgcaggcgga ctgggcgtaa aatgctcaat   2460
ggtcatggcc gctttttgcc ggagagtaag cgagggtttc ttctccatgg gtgtctttct   2520
gtaagttgtc cgggcttaac cggctcttcc tcattcgtct cgtttcaatc gctatcacct   2580
cagttatctc agccgtgcga ggtgcacaaa gtagaggtac tgtccggtgc ttttatgctg   2640
atgcgtggga ggcattggat aaggtcgggt tgctcgacga gcgttttttt atgtaggtga   2700
ggatatcgac ctctcttatc gcttgatatt gggcggatac nacactacta ctatccgact   2760
cctattcttc attacaaagg agaaagttcg tcgtctccga tgttaaatat cttcgttcgt   2820
tctatggggc gatgggtttg ttttcgataa atactataga aacaggatga atccactgct   2880
tcatggactg acaatgtcgt catcaaagca cgtacagctc ttgccttgat gcttcgcagt   2940
tgaggaaggt tccggcggca gagaaacctg ccaaaatatt ctattggcac cttctgaggg   3000
agaggctgct atatctgcct atcacgaccg cagccatacc tgatcaatac cgatggaggtg   3060
acttgtgatc gcctgcttct gactatggga aactggctga taggaagcat actttccatc   3120
tgacgaatga caccacaaaa gggtgatctc accttgatac atcttccctt agaaaggaaa   3180
tctccaactg ttttttttga aagaaagagg ccgtgtgtga tcgtattcgg atcgcatggc   3240
cgttttttgtt tctcttcctt acggcataga gtatactttt cgttcacgat aaattcaact   3300
tcctattgaa ttgcgaggca atctgtatca agcaaaaaga gacctttgca aaatcaagaa   3360
gtatcttttc ggtatcgttt tacccgtaga gcgtgtcgca caagtcatag aggagctgag   3420
gtattcatac tataacgaca cagaaaaaca gtc                                3453
```

```
ggatccccgg gattggttct tcctcttctt ccggtggaga cacggcgcct ccgagacact    60
gaggttggcg aaagagaaag ccttggatcg gcttttggat agaagcagtc gatgccgagg   120
ccacccgatt ggaaagggga ttcgacacga aagaggagct tccgatgagg acagtctcgt   180
tgccggtatc attggcccat tgacccaaag ctgccaaccg ctgccaactg cgtatgtgac   240
cgtaagctcg tgaatggctt tgttcccagc gggtatgcgc taccatcgat gagatatcgg   300
atcggacgat gctgctctcg cctgaaggga gaacgcggag tcgacatcca gcagatccac   360
```

```
cccttttcgag ccgctacccc agcgaagagc taatagtcga actcggagtc gctgatctct    420
ccataacagt acaggtagca aagagatagt tgttgatggt cgggcggaag tccagcttga    480
catcgccttt catgttgtag tcttgaagta cgggacggtg atagctatgc gcgattcgtc    540
aagtcgtcgg gatattccac gtagagcttg agttgttttt tgatgatgca aagtctgcat    600
ctgt                                                                 604
```

(2) INFORMATION FOR SEQ ID NO:431

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 472 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...472

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:431

```
attctgaaca agaaaggtac atttgccggc tttgaagaca catacaagcc atgttcatga     60
actacgagcc agggcgttac acaccggtag aggaaaaaaa aatggtcgta tgatcgtcat    120
cgtagccaaa aagtatgagg gagatataaa gatttcgttg attggaaaaa ccaacgcggt    180
ctccgtaccg aggtgaagtg gcagaagata ttgcttctcc cgttacagct aatgctattc    240
agcaatcgtt aagcaagaat acgagaaaga aggtaatgat ttgacctatg ttctttgatt    300
ggcgatcaca aagatattcc tgccncaatt actccgggga tcgatccgac caggtatatg    360
gacaaatant angtaatgac cactacaacg aatcttcatc ggtcgtttct catgtnagag    420
ctnagaggat ctganaacnc aatcgatcgg actattcact atgagcgcaa ta            472
```

(2) INFORMATION FOR SEQ ID NO:432

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 452 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...452

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:432

```
ttttggagcg tgacgtgtac ttgaaaagca ttgtgccgag taacgctaca cttcggtcga     60
ggagttgcat agagtagcaa tagtggggag agagacgcat ttccacgcat tcgtttcttc    120
ttgcgttaaa tgtccgtaaa tgtcagaaga gagtgtgttg atgggagcag aaacgggtgt    180
ttccggtctc ctgcatgctg caacgagcag gaaacagcct acaatcattc cttaaatctc    240
tgcgttgctg ccgccacggc cgaatgggtg gttcagtgat cgagatagat gaaaacaggt    300
```

```
ttcttacggc caatcggacg gtggatgaaa agggattcat gcaaaagcca atcggcccgt      360
cccctatcgg catgaaaaaa gacccttgca caaaagtaca gggtctcgtc aatatatatt      420
cggaaaattc cgtttcgggt ctaatggatt gg                                    452
```

(2) INFORMATION FOR SEQ ID NO:433

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 758 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...758

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:433

```
ctntagagga tccccgggaa aaagattcgc tttaagcgga aaatgctttc gacttttcgc      60
attttgtaaa caaattcttc ttcttgccaa cgactgatca caaggaggac ttaaggggtt      120
ctcctcaacg ggacgtttta ttttcctcaa acacggatag atagtttcct gttcgatacc      180
gagtttatct gtctggtaag agaaaaaaag tgtgcatagc agtcgtcagc ggctccattc      240
gtcctacatc tctctgtcgg taatgaaagc caagactatc cttcgtgaag tctaaaaatc      300
cccaaattga tcaaagcaag atggttctct tgagtttcga tatgaggagt tcgatgtacc      360
ccttgagcag ggatataagg acttcccatc ggagaacaat tgcgcatcag tcgtcaaggg      420
acagaagcca tcctccatat atgagaaaaa aaggcgttcg gtccaccttc ttcagtaccg      480
ttactttctg gaatcattgc cggaggatct gcgaaagggc atttacacgg atggacacga      540
ttggcctctc atggtgtgtt tcactcttct ttctccaaag agcaccttcc gaatctcgtc      600
agaagctcgc ttctctgtgg gatggtaccg atgtctgggt tttcggatgc cacgtatgat      660
gcccgttggc gatgcggaaa tagccgagcc ggttacttgt acaattcttc gctcaatccg      720
acttgtatcc ccggtgctac aatcatctct cggctcgg                             758
```

(2) INFORMATION FOR SEQ ID NO:434

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 460 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...460

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:434

```
taaccggccg agcgaaaccc tcgtgcccgg tggtcgcgat cgagctgaac gatgtatagg      60
tcatattgga tcttgtggcc gaacagtgga tgactataat ttgatggtat tcattgtttt      120
```

```
ggatgttgat agatgaaaaa attaaaccat tatagaaaga caaaggccgg agacaaaagc    180
aaatttcctt gtctccgcct tccgattaga ttcccgtccc tgctcgaata caggaggaat    240
acggacagaa ttagagaccg ccgcctccgc tgccttgctc accgccgccc tcggagaatc    300
aggaacagag ggagtaccac cttgctgttc tccgggacga agctattgat ccctttcaga    360
cgaatttgcc gacaggcgcg gcgaatatcc ccccgggcag aaagagcacc cgtgctcggc    420
ggatattttc cacggtaaat ctctccttct ttggcggctt                          460
```

(2) INFORMATION FOR SEQ ID NO:435

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 499 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...499

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:435

```
gggattgagg acttcatatt ggcctttaag agggaaaaga tatgttgccg cggtaacgtc     60
gttggacgtc tcaaaggggc actcattaaa ggggagtaat ttccaccggt ggaaaaccgg    120
tgtgtaccaa atagtcgcct gacacagaat aaaaagaatg aacaaaagtg cctgcttatt    180
gtgcaaaggt cccgaaaata gaagaaagag gctaaggata cagtataaag atacagtata    240
aatttcaaat gaaataaccc tggggttaca tcagatttga gtagggagat attgtatggt    300
tagtcgggga gaacaagctt tcgtttcgct gtgatcatat ctatttaatg cgatagatag    360
cggtatgtgg catgccgctt tcaacggcct tacgaacaaa tccattttct ctggcgtgta    420
cttctcgcat atcaatcgta agcatgcacg cactcctcat gatctgctac acgaatgact    480
tgccccttga tattagcac                                                 499
```

(2) INFORMATION FOR SEQ ID NO:436

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 1623 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...1623

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:436

```
tcatttccct ttcggttgga ggacatccaa gaggcatatc gacattcatg ccatgttcaa     60
gatcnatcgt ttccattggc acctgacaga ggatcaggat ggcgtatcga aatcaagaaa    120
tacccacgac tgacgaagtg gggtctaaag gacggaaggg gacggtacgc agtactccgg    180
```

```
tttctacacg caggagaagt acgggatatt gtacaatacg catcggatcg tttcattacg    240
gtgatcccga gatcgaaatg cccggacatg ccatggctgc cctcgctgct tatcgcagtt    300
ggcttgcttc ccacgcgaat tcaagccncg gattatctgg ggatggagca ggatgtttat    360
tgtgccggta aggacagcgt cttccgtttt attctgatgt tatcgacgag gtagcacccc    420
ttttccccgg cacatacttc ctatcggagg ggacgaatgc cctaaagatc gatggaaggc    480
ttgttcgctt gtcagaagcg tatgcgtgac aatgggttga aagacgaaca cgagctgcaa    540
gttatttcat caaacaagct gaaaaggtct tacaaaagca cggcaagaac tgatcggttg    600
ggatgaaatc ctcgaaggcg ggcttgcacc ttctgccccg ttatgagctg gcgtggagag    660
gatggtggca tcgcagcggc taatataatc acgatgtgat catgactccg ggtagcggag    720
gtctctactt ggatcttatc agggagatcc gaccgtcgag cctgttgcca tcggaggtta    780
tgctcattgg agcaagtgta tgcttacaat cctttgccga aagaattgcc ggcgataagc    840
atcgctacgt gctcggagca caggccaatc tgtgggcaga atcctctata cttccgaacg    900
atacgactat caggcctatc caaggctact gctgtggcag agcttacctg gacaccgttg    960
gccaagaaag attttgccga ttctgtcgcc gtttggataa tgcctgcgtt cgtctggaca   1020
tgcatggtac aattaccaca ttccgctgcc cgaacaaccg ggtggctctt ccgactttta   1080
gcctttacgg acaaggctaa gctgaccttc acgacatcgc gtccgataaa atggtctata   1140
cgctggacga aaccgaaccg accctcacat cgactcttac acggtccctc ttgaatttgc   1200
acaaacgggc cttctgaaga ttcgtccgtc acggccggtg ggaagatgag tcccgtacgc   1260
cgcattcgtg tggaaaacaa cccttcaata tgtcaatgga agtaccggca ccgaaacccg   1320
gacgaccatt cgtacggctt acggtgactt atatgatgtg cctgatctgc agaggtagcc   1380
tcatgggaag tagggaccgt tagctctttg gaggaaatca tcacgggaaa gagaagataa   1440
cttctcctga agtactggag cgcagagttg agaggctacc ggttatgtgc ttattccgga   1500
ggatggggta tatgagttcc tcggaaaaca aacgaagttt tggattgata atgggaaagc   1560
ttgatcgaaa tgtgggcgaa gttaagaaat tctcccgtct gcaatagcag tcgttccctt   1620
cag                                                                 1623
```

(2) INFORMATION FOR SEQ ID NO:437

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 542 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...542

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:437

```
ccgacaatcg taccttcaag gccaaactga tcggtagcga tgccacgacg acatagcctt     60
gctgaaagta gatgccaagg ggctgccgac aattccttcg gcgactctga caagcttcgt    120
gtgggagagt gggtattggc cgtaggcatc cttttaatct tacttccacg gtaacggccg    180
gcatcgtcag cgcaaaggtc gctccactca tcaggtggcc agaggcggtt cgctccagat    240
agaattttta ttcagacgga tgctgccgtc aattcaggca acagcggcgg tgcgtggtga    300
atgatcgtgg cgaactgatc ggtatcaata cgatgatcta cagcaaacgg gcaactatgc    360
cggctactca tttgccgnac ctatttccat agggcgaaag tggtagccga catcaagcag    420
tacggaaccg tacagcgcgc ctgctgggca ttgccggcgg agatatatcg gacgaagcac    480
gtcaaagaat cgatctgaag tgcgcaaggg tgctctcgta gcagactttg ccgaagtcat    540
gc                                                                   542
```

(2) INFORMATION FOR SEQ ID NO:438

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 786 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double

```
        (D) TOPOLOGY: circular

   (ii) MOLECULE TYPE: DNA (genomic)

  (iii) HYPOTHETICAL: NO

   (iv) ANTI-SENSE: UNKNOWN

   (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

   (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...786

   (xi) SEQUENCE DESCRIPTION: SEQ ID NO:438
```

```
ggatgatacg atcgccggcc gcccatccct ttatcccggc cagtacaata tcaagagaaa    60
aattttcagt cttttcattg ctctaaattc tttattatat tagttgtgta taacaaagaa   120
cctatatgaa tctgaaaaga atctgaatga caaaagattt tgaaaaaatt ttttccgacc   180
ggctgatcga gcacttctta tgcttccttg ccgatggaaa aagtgtgttt cccattctcg   240
aagcgtaagt cagtcggagt ccgtacagct ggcatataga gcgtgcaatg ggaaccccaa   300
gccggaagaa tgagcctgtt tcatatcgtg atagaaacgt tcgatatcaa ggtctcgtcc   360
aaagcgttct tcacccccgt attcgctatg ctcaatgcat agaggtaaga tcgatatgga   420
tctctccatc tctttcaaga atgtgcaaga gtatgccgtt cttaagcagg ttgcttagca   480
agactttggc aaagtcgggt tcattgatag aaccattggt tcacttctgc tccatacaag   540
cgaatacgtc gattggcgaa aatcgcttca tactcctccg ccaaattagc aatagctcat   600
tcacatctat gctttcctcc tcagggaatt gatggtttcg attttgctat agaggaggag   660
ggtttttattg agctgtacaa tatggtgatg gactgtatag ccttataaat ctgttcgagc   720
tgctgtcatt caaagaggga tcttgcagta gcatttccag tttattgcgg cttatggcca   780
gagggt                                                               786
```

```
(2) INFORMATION FOR SEQ ID NO:439

     (i) SEQUENCE CHARACTERISTICS:
         (A) LENGTH: 2956 base pairs
         (B) TYPE: nucleic acid
         (C) STRANDEDNESS: double
         (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
         (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
         (A) NAME/KEY: misc_feature
         (B) LOCATION 1...2956

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:439
```

```
cggctgattg cgtacttcgc cgaattcgtc ttggccggtc atgatcggaa aatggcttgg    60
atcttaatgt ccacatcgct attggtcgga gtgaagtaca ttcttccttt acgtagtagg   120
ctttgacttc tgccgagggg atgtcgcatc tgccaccttg aagagctccg cattcttgtt   180
cgtactcggt tggtaaagat gccaaacctg tccagaaact cttggaactt gatcttgtac   240
tggtcgtgaa ggcttcgaat ccatccagat attcgtacac gtcgaggctg ttggattgat   300
gagtccgaat atcgtgctga agagattctt gcgatcacca atcgccgggg aggataatag   360
agtaccgcat tggactcttc catcaggtct accgtcggta cacgactcgc ctccagggg    420
cgttgtcggt cttctgtgtc aacgtctgtt gaattcctga gcacgattgg atagagtagt   480
cgtttgttcc cctcggtatt gcgcggtgct cgacccactt gcggagagcg gttgttcgtt   540
tttcctgcgc aacggacgag atactgaccg tcgctgcaag gatcgctcta tgactgcttt   600
gaatactttc ataaacacta ttagttcaca attacttaat ggccggaatc ttacgttcga   660
taccatccgg accgcgtgca attactctgt tacgtagaaa cgcttgcctt tgcccagatt   720
```

```
ctgtatttgt cgttttgtct ctcagagaat gaagctccgt cggaaacttc gggaatcgag    780
ttgccatcga atcatagaat acgagttgga acttcaccac tgtgtagttt actccagcaa    840
atcatcgtca agagcggctt taatgccgcc tgctgccagg attcacgctt acccaaacgg    900
ccacccttga agcgtttcgt gttcccctgc aatccttata ttcgatatag ggaagaggat    960
cggggagagc tctgacacgt aggtagtctt tgccatttgg atggtacggc ctcctgattg   1020
agctgtgacg aaataatggc ttcgctgcct actttcgtcg gccgtgctat ccagagatgc   1080
cacggcgagt gagcgtacca ttgttgatcg ttgcagaaac gttttgcgag ccacacccgg   1140
tacggcgata ttgatcggat tgtctatacc ggcataagta cgttcatcat cgtcggagca   1200
acggaggcca ttggttccgt aacgagtatt cgctttcaaa gtcacggcga atcttaaccc   1260
catcgttacc catctttcga tatatccttt gaccggatat gtgcccggtg cacctgccgt   1320
agcgtaaata ggcccatgtt ctcgggagaa aggagcttac cgtttacaaa tagtccggtc   1380
tttgcgtggt atctacactg gagaggacga tattggcctt aatgtatcgc ccgacatgac   1440
gatttggctc tgtggaatca cttgtgccgt atactgttca cacgataatc ccccacatcc   1500
acgctcttta ccagatcgga agtacttcgc cctgagcata acgcacatcg ctttggagct   1560
tggtcagggt gtaatggctg ctacagtagg catattctcg aacaaagaac tttcccagat   1620
ttgcctttgg tgccggattc tgtgttaagg gcttgttcta tgagttcaac ttcgccttgt   1680
cggtcatgag tgtagcgacc agctcgcgga acttgccacc tccttgcgaa gtgtgctgcc   1740
tttaccgttg atcggattca gcatattacg gaagaagcat cgagattgtc ctttcgtctg   1800
atatcattga ctttgcatct ttcccatccg actcacgggc aatggccaac ttcagatcat   1860
cttaaaggta cagagcgaat ctgcctcttt ctgtaagaca aggctacgct taccatact    1920
ttcacctttt cgggattggt gcgataagcc gtattcagct ggacagcacc agattgttgc   1980
gcttatcgga gccgtcgatg gaagaggcta gctcttatcc actttgtcga aaccatccag   2040
tacctcactc gatacgttaa agccatcatg gcgatgaaca cgaggtacat caggttgatc   2100
atcttttcct attggcattc ccattagaac ctactgccat ggcttataag ggtgagtgcc   2160
ggatgatgaa ggattagaag caccaaaatt gccgggcata ccgggagacc tacattcgtt   2220
gtcaaggctt ggagcaagcg agcatacacc tcgtgagttg tgtcagttgg cgtgccatac   2280
gctcgttttc gttgcggaat gaaaactgtc gatgacacta ttgtcataca tatctcggat   2340
atgagccaat cccggttgat gcgatcgatg gtgtcgatct gggagctgat gcccttgagc   2400
ttatttcgta tatggtattc aggccggaga tattgcgact gaggctttcc tctgctggat   2460
atacgattgc gaattgagac gcaggccttc ctgatccgct gcatctgctc gtagctctcc   2520
gtcatggcgg ctgcagtccg gccgatacgg caagctgttc gcctgcttca gccagtttgt   2580
ctatgccttc gctcagggtt ggatctgctc ttccggcagt attccggtca gttgggactg   2640
gaaagggtgg caggcttggg ctgttcttgc ggttgcgtac ccaaagaggc agaggaaggc   2700
gcacagaaga tggtctttcc gcgtatgcag ctgcttcttt ggcctttcac gaagatactc   2760
ccgacgctgc tccatctccc gacggtccat cggttcttcg agtccagttc ggggaagacc   2820
tcttcccagt gatattccat tggggttttt caaatccgga gataaaaaac acccagaatt   2880
ctgtgatcat ccacgaaaag catctcattg gccatcggca aatggagcaa cttgaagaga   2940
cgccaaaatc accact                                                   2956
```

(2) INFORMATION FOR SEQ ID NO:440

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 432 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...432

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:440

```
cagcaaatat aacacttgga gtgtaggaac tcaatctcac cctgagcatt cgtagataaa    60
tacgtatttg tattttgcta gactcgcagt gcttgagcat agtttgatga cttgcatata   120
ctcctcatgg agctctagat tgtgtattca gtacgaataa aatcgtgagg aaaagatgcg   180
tcttgatact tcggattttg agtaaagagg agtatacata cggatcctta cctatgagga   240
tctgcacata gttccctctc tctctagaaa ggcagatagt tccttatca caaggccata   300
```

```
cctgggacat cccaatatcc cgtggctatt cgaactcgat tgaccaatcc aatctaaaac    360
attgtttcag acaggaactc atagaaagtt cggcgaagaa ttatcaatta agggattgcg    420
taatagcata gt                                                        432
```

(2) INFORMATION FOR SEQ ID NO:441

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 698 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...698

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:441

```
gcagagtgat ttcctcagaa aagcgaatcg gatcctggat gaaacggcaa gggaaaacta    60
cagttttcgg cattattccc tgagatgcgc caccgattat ccctccacag aatccgaaga   120
gcaaagaccg gagggaaaag gctgaaagac tttggagaaa tacaagcagg agataaaggg   180
gaggaaagac aagctcatag ccaactgctg tcggcattcg atatgaatca gagacaactg   240
ccctccgtct tctggatgaa tggatgaata tcaggcctgc aagccattca gtcagcttcg   300
tacttatgtc aagcagctca atgaagactg ccgactacgc ctgggaagtt tcggaaggat   360
ggcgatggga aagctcgtgc catacctctc gtggtgaaat ggctaccttc ctctctcagg   420
acatcgtccg catgatcata acgaagagac gaagaagctg atcacctccg cttactacaa   480
tgagatgcaa gctctctggc acaatatgcc ggagaagaga atcgccgcca attcagggca   540
tcgtggcaga actgcacctt cttgacccct cttccggaca tccgttcctt ccgcgaccat   600
ggagacagct catcggtata cggaagactt ctacaaagct atctcgagaa gaaacgggaa   660
tggttggcaa aaactttcta tcggccggta ccgagctg                           698
```

(2) INFORMATION FOR SEQ ID NO:442

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 826 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...826

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:442

```
ccctggacag gtaccacaca tgcggagttc atagaagcct tgggacgttg cgcaagaaag    60
gggctacgag ccttatcctc gatctgcgag aaaatcgggc ggtttgctgg agccggctat   120
tgccatggcc aatgaatttt tgggtaaaat ctccccattc ttcagatcga aggcaaagcg   180
```

```
tatccgcgtg aggagattcg tccgatgggc aaaaggtatc ttgcagcaaa ttcctctggt    240
agtgcggtgg atgagttctc ggcaagcagc agcgaggtat ttaccggtgc catgaagacc    300
atgaccgcgc tcaaatcatc ggtcgccgga cgttcggcaa gggctggtgc aactgccgtt    360
cgatttggca gatggttctg ccatccgcct gacgtagcac gctattatac gccatcggga    420
cgctccattc agaagccgta tcttccggcg tagatgaaaa ttactatcag gatctgagga    480
atcgcttcaa cacggagagc tatactcggc cgacagcata ccttcactgg gaggaaagaa    540
ttcaagacag ccggtggccg cgaagtctat ggtggcggtg gcatcatacg gatattttta    600
tcccactgga tacagccggt cttaattcct atatgataaa gtggaggatt cggatttgat    660
ccctcgctat gctttcctgt acagcgtgcg aacagggttt ccttgagtcg ttttaagaca    720
gtcgaggagt tgggacttat ctggatcgta cttatctgat tttcgacttt gcttcttttg    780
                                                                      826
ccaggtaccg gatcccgatg ccgtactttt tttaatcaac gaagct
```

(2) INFORMATION FOR SEQ ID NO:443

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 916 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...916

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:443

```
ccaggattgg caaaggcatt gcgccaaagg atgaagcgct ggggatcatt gataatcaca     60
tatcccgtag ccccgggctg atcgcgcaaa tatacatcgc aagagcaacg acttcgcgga    120
caattacatc agaaggaaga ccgaccacac accatgtcct tcatatgcca aatcgtacac    180
atgcctacgc atttctccgg catatcggcc gtgtattcat tatcgacacg cttatcagga    240
ttggttcacg taaataatct tgccactcca tcctgcgaca atgctcctgg gtcaatcaaa    300
tacatcttca taacaacgga atgaagcagc tatatccttg gcccatcaca aatctgcggt    360
aagaagctgt agttctcagg aggcaaagtg ccgattcatc gaaaaagcga gcacgcaagg    420
cctcgaagcg tgccgtctct ttcgtccaac acgcatcttg atgctccgtc cgcctttata    480
gcttacatag tggagctata ctcaggcgta tagtcaaatt cgccccaagg ataaccggga    540
cctgatcttg aagaaagagt gttactgcct cgatatgctt gcatgttcaa gcccattcgt    600
tctaaaatcg agacaagaac aataattccg ttcgctcgaa caccacggaa tgcaactcgg    660
tatcggttgc ggccgtttgc gaccaataat cgccccatat ccgattctca tccaaatgtt    720
caacatcgaa aggatctgtt cagcaaattc tcttcttaat cctacttgcc actcttctac    780
ggtctgcctt ccggacaaaa ccgattagac aatttctgtt ctttcattga ataaccttct    840
tttactttac attatatatt gtctgcagaa ttcatgtgta catatcaatc cggccttttt    900
                                                                      916
cgagttcggc tttcac
```

(2) INFORMATION FOR SEQ ID NO:444

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 1873 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
    (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...1873

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:444

```
tttgagtctt ccaaaaagat gttgtagaaa gatttaccat agcgcgaaaa gttattttag      60
tttccacttg agtggattta cctttcatac tttattcacc tttttaataa aaatcatctg     120
taagaatatt actatgcaat ggcaagactt taccgtcagc gcgtttgctc tgcagacgaa     180
gctgtcgtgg actctctaaa ccgggaacga aagttgtatt cggtcatgct gctgctgcgc     240
ctgtcgtttc tctcaggcta tgtaccgcca gcgtgaaaag ttggagaata tcacgttttc     300
cacatgttgt atttcggcga cgcgccgcac cttgctcccg aaagcgttcg catgtacacc     360
cgactctcaa cttccttgag ggcaactccc gtcggcaagc cgtgaccgtc gtgtcgattt     420
cattccctgc cacttccacg agtaccggaa ctgtttcgtc agggattctt tccattggat     480
gtagccgtag gcaggtatct actcctaacg aagagggtta ttgctctttc ggagtttccg     540
cgactacaca aaggctgccg ccgagtgcgc tccggtagta gtagccgagt gaacaagcaa     600
atgccattca tcggtggtga aaacctgatt cacatctcaa actgacccat atcatcgaag     660
tggacgagcc gattgcagaa gtattgctcc tgctatcagc gaccttgaac tgaggatagg     720
tcagaattgt gcctcctgat caaagacggc gataccctcc agttgggtat cggcggtatc     780
cccgcgctgt gttgcgtgca ttggaagggc ataaagatct cggtattcac acgaaatgtt     840
taccgacggg gtgatgcgta tgattcgcaa ggggattatc aagggaagaa aaaaacattg     900
catcccgaaa aagtcgttac ctcgctaatc tcggatcgaa agaattgtac gattttgtca     960
ataacaatcc ggtgatagaa gctatccggt ggattatatc aacaaccccg atgttatcgg    1020
taagaatgac gcatggtttc tatcaattcc tgcttggaga tggatctcat ggggcaggag    1080
cttctgagtc gatcgggtac gaacagttca gtggatccgg aggtcaatcg atttccttcg    1140
tggggccaag cgttccaagg gaggaatctc cattatgctt tccccagtac ggccaagaaa    1200
gggactgaga gtcgcatcgt tcccatctga aagagggtgc ttgtgtcacg accggccgta    1260
acgaagtgga ctattggtga cggaatatgg cgtagcgcgt ctgcgtggcg caacgcttcg    1320
tcacgtgctg aagccttgac tgctatagca catcccgatt tccgaccggc cctgaggagg    1380
aaatccgccg acgcttcgaa taagtcggaa ggattttagg cttatataaa cggattcgaa    1440
gccatgtaca actacattgt gtacatggct cgtatgttta acgtgagttc aatgtaagcg    1500
atatggtgcc gattctctct gatgggatat tgactataac cgaatcagaa aatgaaaggg    1560
aaaaagttga cgtctcatcg gacgtcggag cctctcgaag ctgaaacctc tcaacagcaa    1620
atgaaataca ttgacaaaca gcatattgca tgtttttctt ggatcgatcc gcattgtttt    1680
atagccgttc ggaacatacg ccgaaagggg gtcgactacg ccctacagcg actcgggcta    1740
cgccgtagag cgtaccgagc tgcgtctacg gctcttcgag ctacgctgta gagcgtacct    1800
cgccgagctc tacgcgtagc tcgaagagcc gtacgggata gctcgtcatc ctctatggtg    1860
tacgccatct tgc                                                       1873
```

(2) INFORMATION FOR SEQ ID NO:445

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 3285 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...3285

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:445

```
agggtacgga ttttcagtcg acncatcggt aggtccggat gagtccgacc accagagaag      60
atatttcggt acgtttcatg cgctattttt gtgttggaga ctcccaatag cctatcgaca     120
```

```
aatacttttt cctgatcgaa catcagttta cttccaccgg caggtaataa aatctttcct    180
gcatctcttg cggaaagaag attgtcgtag ggccagtcgc atggcatctt tctcggtaca    240
taccatatgg cattggcatc tttccgatgc agttcgtgcc aatcttggat gagcaacaga    300
tctctctgtc ggtaaactca tgatgatccg gatagatgcg atcgttccgg aggggaatcg    360
ggtgcgtatt tctcggaaga acagtttcgg actgctattc cggcgatagc cagcgcagag    420
cgtacttctg ccgaaggaca cgatcggaaa acaaaggctt cagtccctgt ccgtacagaa    480
atttggagaa aacagcttct gatgcgggta taaggccaag tcgcgtttgg ctgctctaaa    540
tctatgggag caagatcatc ggggcatttg gtcaggatta ccatatcgca cgctgtatag    600
agccggcagg ttctctcaga cgaccggccg gaagcagtag tctttggtca gaatacggtt    660
gtagtctgtg agtactatgt tcaggttgct ttcaccttac ggtgttggaa gccatcgtcc    720
agaacgatga gctgtgcctt tgctcttctg ccagatcgca tagatagccg atggctctgc    780
tccgtcagca tccacgatga cggtcaggtc cggatatttt cgtttgatct gacaggttcg    840
tctcctatat cccatgcagt cgatccttcg gttgcaacga tctccctttg gttttccgct    900
tatagccgcg gctaaccact gctacacgat acgtggatgc aggagccgaa tcaggtattc    960
tacgtggggt gtcttaccgg gccgccgatg gtgatattgc ctacacagac gatagggatg   1020
tcgaaagagt cgaaatcagg acgttcttgt cgaagaggta gttgcgcaac ctcacgccac   1080
cccgtagagg gcggaaagcg gtttgagcca cttgttgata cggggcgatc catctcttca   1140
gcaattacgg ttgtctcatt tatcagtacg gcatgagtaa taggggagac gtgcctgtat   1200
gcccgaagga cggggcggca tggagggagt tcgcgcagaa cttctatttc cggatcggag   1260
agaatggtac tcagatggca gacttcatat ccgctgctga tgaggagagc aactcttcga   1320
agagttgcgc ttggtcttgc catactctat gctgtagttg ccaccgagct gaccagcttc   1380
gcggcccgtt tgatagctgt gtccaaacct ccaagctcat caccaaaccg agtgcaagag   1440
ctttgtcgcc gagccataca cggccttgag gatgctgtcg atctgtgcct tggtgcggtt   1500
gcggccttcc gatacgcgat gaggaagagg tcgtagccct gctctatgta gcgttggatg   1560
agggcacgtc ttcgaccgtc atcggagcga aggtgttgcc caagtctgca tacttggtgt   1620
ctgtacgacg tccatattca ctcctatctt cttggctacg cccgcgagtt cgggaacatg   1680
ccgaatatgc cgatggagcc ggtcagagtc gtatgtctgc cacgatactg ttggctgcgc   1740
aggctatgta gtatccgccc gaggtgctac gtcgcccatg gagaccacga taggctttt   1800
ggccttgaga tcgctacctg cttccatatc tgttcggaag tgaaagcact acctcccgga   1860
gattgacacg aagtactacg gctttgatat catcgtcatc ggctgctgcc tgatttctttt   1920
ggcgagttct tgtgtgatgg agctaccgtc agtgtcgaac gcttctttat tatttcttcc   1980
gttatttcac cttcggcaaa gagaacggca tccgactgcc tttcgttttg ttcatcgggc   2040
cattggccag aacctgagaa gcgatacgaa ccgaagttca tctttctctc cgcgttggga   2100
catcttttga gttctttctc cacatcggta cggtaagcca gctcatccac gagcttatct   2160
ccaccgcttt ctcggcaaga ccgaacattt cgcctttgtc ggcaacattt tcacggaatc   2220
cattgccgtc ttgcgcgact ctgcaatatc ggattgatct tgtcccaaag cccgtttatg   2280
tatgtggtga tttgttcgcg attgcatcgc tcatcctgtt gagcatgaat ggctctacgg   2340
ctgccttgta gggcctacct tgaagatctc catcttcacg ccgaatttgt cgagggcatc   2400
ttgtagaaca ttgtttgggt cgcaatcccg ataagcccca acattccttt ggattgaggt   2460
agagtttgtc tgcaatactg gagaggtagt aacccttttg gtgtatctgt cggcatagga   2520
tacgacgaac ttgcccgaca tcttgaaacc tgcaacgcgc gacgcaattc ctctgccgat   2580
gccataccga cggaaagttg tccagatcga ggaagatacc ggttatgttg ggattatttt   2640
tggcttgccg atggcttcga ctgcctgtga gagcgatacg gactcgtctt tgccttgagc   2700
atgctccagg gattggccga tacgatctca gggaaagaag aatttctata tgtaggatgg   2760
agtttgcttc gatcttcgga atggttcctc ccgtgccttg gaggcaatac cggctacgat   2820
gccgaaaaag ataaatagaa agtacagaac aagatgattc ctgccgttat aaccccgagg   2880
atcgaggcga aaacattttg aaaaattctt tcatttcaga tttgctattt gtttctgtgc   2940
ttattgtttt taatgtcact attgcaaagg taagtattta atttacagtt cgcacgggtt   3000
ttgcttgcca acctctgtca ttttcggcat gcaagaacaa gaaagagcta cctgctaaaa   3060
tattccgact cattttcaag cagccttttc ttgatgatcg attgtccatt gccgtagaaa   3120
gaagaacttg aatgataagt agagacggcg atcgaatttt gattcttgct tttcaataaa   3180
gaagagaata aaacctgatt catacagggg atgaagtgca tatttcattg cattcgtttg   3240
atgggtgtcg agttgataga attgatttta cagaccgaga ctttg              3285
```

(2) INFORMATION FOR SEQ ID NO:446

    (i) SEQUENCE CHARACTERISTICS:
      (A) LENGTH: 719 base pairs
      (B) TYPE: nucleic acid
      (C) STRANDEDNESS: double
      (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

```
(vi) ORIGINAL SOURCE:
     (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
     (A) NAME/KEY: misc_feature
     (B) LOCATION 1...719

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:446
```

```
gcgaactcgt cgcattggga cgtagccctt ataccggatt ctggggcagt tgcagaaagg      60
agacagaaag ctcgtggcag aagccgtaga acgtgtggaa tcgctccgct gatcaatcgc     120
gaactaacta cgctcagcga tggagaggac aaaaagtagt catcgcaaaa gccctggcac     180
agcagacacc gatcatttcc tcgacgaacc gacggctttc ctcgattatc ccagcaagat     240
ggaacgttgc acctcttgca cagcctggcc catgataccg gcaggactat cttctctcca     300
ctcatgatct ggatgccatt ttacccatgg ccgatcgcgt ttgctgctgg acaaggagcg     360
ttctttccgt gagggctcgc cggcatcttt ggctctgcgc ttgaagatta tttcggctat     420
atccatcctt ctcccacatt aagccggtgt agcatgctcg ccggtgtata atccgatagc     480
tttgctcccc aatcaaagct atccggacag cccgatcgtt ccccttctct ttcctcttta     540
gttataatga gccgaagtat agctcctttc ggtataggaa tccatgcctt tgacctgccg     600
tcatgtatgc aaggccgact tataccataa gagctgttct gtaaaaacgg aaaaggagtg     660
tgccaaatgc agtgaaccct gaaagtcgat acaaaacatt cagggttcac ttcaaaacc     719
```

```
(2) INFORMATION FOR SEQ ID NO:447

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 887 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

   (ii) MOLECULE TYPE: DNA (genomic)

  (iii) HYPOTHETICAL: NO

   (iv) ANTI-SENSE: UNKNOWN

   (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

   (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...887

   (xi) SEQUENCE DESCRIPTION: SEQ ID NO:447
```

```
actctagagg atccccggca gtcgtatacg acatgcaggg ccgaatcgtg agaaagtttc      60
attttcaggg aaagaatata agctgaatgt gcagtatcgt ccaaaggtac gtacatgctg     120
aaagttgtag cggatacgga gtatttctgg aaaaaatcat tgtagagtaa gaaatcggca     180
cgaaaaatct aagaacgaaa aagacacctg agtcttggag tgggaatgct tgtcggaaga     240
gaatccccga cttctttccc gctttgaggc gatgaacagc gaactctccc gtccatctgc     300
gggagggttt aagaccccct tatacacaag ggtctctaat aaatgtgacc ggatccatga     360
gaggagagt cgtcctgaca aaccctcttg tgatcttct tttttctat cggcttgaat     420
ggtggcaaaa cgcaccggct cacattcagg atgttccggc gtcggggata gctcaaggtc     480
ggtttgcgct caaaattttc gtgtttgtga cctctaaaaa cgtggtgcgt aaactgtttg     540
ttttggcgtg ggaagtgaaa aatttacgca ccacgacgaa aaaaatctgt tccgttttct     600
cggaaaacac agaccgcaat cggcagattt ttggctcagg ttggccggag atcggatcac     660
cgaagcgagg ctgatgcatc ggtataatga gccaagggat gtatctgtag gaattgacgt     720
actttttgtcc ggaacaagtc cgtttttagag tatgcgcttt gatgaattga atttaggaga     780
tgaatattgg atggtctcga tgccatgaat ttcatcgaga ccacacctgt gcactgcaac     840
catccaccca ttctggaggt cgcgatgtga tcgcttgtgc caacgca                  887
```

```
(2) INFORMATION FOR SEQ ID NO:448

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 674 base pairs
```

```
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...674

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:448
```

```
gccaaaaaaa gtttttttcat aatgatttttt ctcattggtt attagcgacg caaaggtatc    60
ggccgccatc agacaggcca atacctacct tagggtatct tttcacttat ttggatggaa   120
ttaggtattt ctgacgatat tcctaatgtt tgctgttacc tcttgaggat attccttata   180
ggtgtctcct atatgggacc tttgcccaac aagcaggcat tttatccatt cattttattg   240
tgtacggccg attgtttttgt gtgtttatgg tatgatcaat gacacaaaac gatgtacgac   300
aaggaaaatc atccgacgag aagaggtttc attcagggac gtctgccagc gaatcgatac   360
gggaaagcac ggaatgtatt tttgacccaa gtgatacgct tatatgagag gatactatgg   420
tctcctatga gaggatacta tgtctcacat gagaggatac tatggtctcc tatgagagga   480
tctatggtct ctatgagagg atactatggt ctcctatgag aggatactat ggtctcatag   540
agaggatact atggtctcat atgagaggat actatggtct cgcatgaggg atactatggt   600
ctcctatgag aggatactat gatctcgcat gagagggact atggctattg atggaagatg   660
ctatctgctc tctg                                                      674
```

```
(2) INFORMATION FOR SEQ ID NO:449

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 484 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...484

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:449
```

```
atccccgaaa ctcttcttgc gacaggctta ctgttttcag ttgacttnca atcttttaca    60
ttcgaggaaa cgtattttgt ctgccaactc cttacgagtt cttctgtcag ttcaaaagca   120
ttccaaaagca ttttttactt tttctccaat acttt cttgc catctctggg aaatagcaaa  180
cctccaaaag atgaagtatt cttcgaattg ggacaaattt ccttgctcaa tatctatggg   240
ctgtactctt ttgaatgtat gtttttgcaag agatgcctta actcttgact gggattgttt   300
cgttcaggct atctgtcatt attcgggaaa aaggaataga agacaatgaa aggcctgtac   360
tgcagattct ttatcattgt tcaagaaggt gttcattcct aagtagtaat aatctatagg   420
agccggctct ttttgagtcg aactttgtct atggcatctg tgataatggt tctttttgacc   480
aaga                                                                 484
```

```
(2) INFORMATION FOR SEQ ID NO:450
```

(i) SEQUENCE CHARACTERISTICS:
    (A) LENGTH: 3367 base pairs
    (B) TYPE: nucleic acid
    (C) STRANDEDNESS: double
    (D) TOPOLOGY: circular

(ii) MOLECULE TYPE: DNA (genomic)

(iii) HYPOTHETICAL: NO

(iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
    (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...3367

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:450

```
ggctggtacc cgatagaact ggctgatggc aaggaaggct ggcttcctgt accgtcctca    60
ctcgtattca tgtctctccc gcagactgat atttaccttc ttgcatatat gttttttggaa  120
tacattcttg aagtagaaag gaacctcttt tgactctgaa cggagtacag catcctttgt   180
tggacggttt tttctattga tctcggccaa atggacttgg gtgataatgt ccatcgcgtt   240
tctgtcttcc tttttttataa gaaaccgaca aaggaagctc tcttcatcgt aggacagtct  300
tattgagcgt actcatctgc gatcaactct cctcttcttt tttaagcctt tcttcgcaag   360
attccgccct tcgcaccacc ctgattttat cgctatgtga agacggtcta cggctatcgg   420
ggaggaaagt acggatttat ccagggcata cgacgaacta catatcgctg gcattattta   480
cgagccgtat tttcggaata aattctacac gtggacgatc tggagcgtcg tcgcactcgc   540
atctatagcc gtatttatat cggagtgcat ttcatcaccg atattatccg ggtatcgccg   600
tcggacttat cgtaggacac tttgtttata aagtctactg tatgcacgtt cccgttggtt   660
gggagcctca tgccctgccc atccgtggca gtctatgccg gcgattccat tcggctttgg   720
acacttagcc tcatcgcttt gtctttgcca tgctgtgtat gtcccgccag ttgacggaga   780
tactcagtac tatgtcttcc tgctcttctg aggaaattcc tcggtatcaa tctcgaggag   840
gagctgtagt tcgtccgtgg tgatatcctg atgaatctcc cccggtaggc gaacgaaatc   900
cgccctctct cttcgctgat aataatgatc tggcatccgt ctcctgcgag agacccagag   960
cagatcggtg gcgcaatccc aatccttgtt cagatccgta ttgtatgcga ccggcaggat  1020
acagccggcg caatgatgct attgtccgca atcaccatgg caccgtcgtg cagcggacgt   1080
ttttgaagaa aatgtttttcg accagacggg catttacttc ggcgcggaca cttcgcccgt  1140
atgggcaaac ggagtgaggt ctattccctg ctggatgcga tgagagcgcc ggtcttcttg  1200
cgagccatgt tcatacaggc aagcagagcg gagctatgat acggcgttcg tcctgcaaat  1260
cctgttcgcg ctttccttat tgagaagacg cttgagcgaa cgccatcggc gcgtagagcc  1320
tatgccgtga gcatcttgcg cagctctccc tgaaaaagaa tgaccagtac gagaacccca  1380
agctgacgaa ctgattgagg atggctccca tcagacgcag cggaatatct gcgatacgat  1440
gatccaaatg acgaagaagg tgagaatccc gagaaaagag ccttgctgcc cgagtgcttg  1500
aaagtggtat aaacggcatg atgaataaag ccacgagcag gatgtctatt acatccttga   1560
tggtaaacgg agaaacatga gattgagatg ttttttgtg gagtgagaat ttctgttccg   1620
atagagaggc gttgccctta cttgacgacg ccgagtttgt cggctaacgg catacttcca   1680
ccgcttcccg cacatcgtgc acccgaagaa tgtcccccca tgcatgacac tgtacatatt   1740
cagtgccgtg gtaccgttga gagctcctcc ggagtggtgc cgaatagttt gtagatcata   1800
ctcttgcgcg agacccgacc aggatgggaa gctccagctc gccgaaagcc tcctcctgcc   1860
gcatagcaat tcgtaattct gctccagcgt cttgctgaaa ccataacccg gtcgaggata   1920
atgtcgtgca gacccaatcc gcgcagctct ccgacacgct cacgaagtaa tccagtatat   1980
ctaccgcaat gtcttcgtag tcggtgaggt ctgcatcgta gccggtgtgc cgcgcatgtg   2040
catcaggata tagggcactg caaagccgcc accgtgcgga acatatcgcc gtcgagctgt   2100
ccgccggaat atcgttgacg atgggctacc ccgtactctt ctacgcacat cttcgcacat   2160
cggcacggaa ggtatccacc gataccggca tgtccgaaaa ctcatccgca atactttcag   2220
tgccgggcgc agtcgctcca tttcctcctg tgccatatgt gatccgcatt aggacgtgag   2280
gaataagcac cgacgtcgat caagcccctc cttcttcgac gatttcgcgt cccgactcc    2340
gcacactgtc cagctcgaga ggcggctgcc ggagtaaaaa gaatcggggg tgatattcat   2400
atgcccatta cgacgggctt ttccaggctg aaaagcctgc cgccgaggtt agagtcttcc   2460
gtttcatctg cttgatgctt tcttttgaca ccccaaaat agccaattcg atccataccg   2520
aggtcgtaag atattcacac ccattggagc acattccggt ctcgagtgca acgtgaccga   2580
ttgggtttta tagccggtac ggcagtgtag gggtgcagaa gttctgttcg actttttagg   2640
ttccggattt tctcgtttta cagtcagcaa aacgtggttc gagaaaattt ttgtttggcg   2700
tggaaaaaat aatttatcga accaaaacga aaaaaattac gcgcagtttt cccgtttca    2760
```

```
ggaacggcaa tttcatcatt tttggttcca aaacgggagg cactcctatc gaatcacctt    2820
aaaagagcct cgatattgcc cagaagtgta aagaatcctt ggcagataaa tattcagttg    2880
gattaaactc ctgtgaaagc agatttaatt ctctgtattt ttttgttggt ttttatctaa    2940
gtttatgtgt acatttgttt ttcaaaactt caaaaatcaa ttcgtatggt tttaaagaca    3000
tcttgaggca actttcagag agaatcgaaa aacttagaac aatttgcaaa cagaggaggc    3060
aacgaagaat gcacttatca tgccattatt caggcgatgg gatatgacgt gtttaatccg    3120
ttggaagtta ttccggattt acttgcgata taggcacaaa aaagggagag aagattgatt    3180
atgcattatg cgtgataatg aacccatcat tttgattgag tgcaaacatt ggcggatacc    3240
cttactcttg ccgataatca actattaagg tactttcatg tttgtctgca aaattcggga    3300
tgctaactaa cggtatcatc tatcgcttct atcagacttg gatcaagcta ataaatgga    3360
tgaaaac                                                              3367
```

(2) INFORMATION FOR SEQ ID NO:451

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 638 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...638

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:451

```
tcagatagcg ccattttcca cggggcagat tcttcttggt cagtccggca aataaacgcg     60
atccagtttg acaacacgat agccaaggtg ttcaaacaac ggcgcacaat acgatttcgt    120
ccgctatgaa tctctattcc cacctgcaaa gatcgtcttc ttttacgtaa ctgatggcat    180
cggcatgtat ctcacctcat ccaattccac gccgtcggct attttctgca tgtcttcaat    240
gcttaatctt tattgagcca cacgtggtag atcttcttct tcttgaaaga cggagggtca    300
gcttagaggc aagatcgcca tcatttgtaa tcagaagtac accgtagtat tccgatccaa    360
acgtcctacc ggatatattc tctcaggaca ggatatcgta ctatatccat tactgtggta    420
cggcattcgg ggtcatcaga atggtcacac aattttttagg cttattgagc agtacataaa    480
ctttactctc atttccactc tcttatcctt gtagattacc tcatcctgac gtgtaaattt    540
tctaccgagt tcggtcacga cttcttcatt gacccgtgat ctcttccttt tcgatcagca    600
gaatccggtt tcctttcgcg agcaaaccac cgggcatg                            638
```

(2) INFORMATION FOR SEQ ID NO:452

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 1401 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature

(B) LOCATION 1...1401

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:452

```
ggcattacct cgttgttcac tctgagaaag gggaattgac tgccgaagga atgtcatatc      60
cggctatcgc tatcttcagg acagtacgcg agtatttgct atatggagac ggagcagcag     120
cctgtgacgt acgctcgccg ttcggaaaag gcgagtacat ctggaataag ggcaaggtaa     180
cgggcaaaac tctcgtctga actacgatct ggccggaacg gatctcttcc ttcgctatgg     240
tatttctata tcagtgtggc acaagccaaa aagaatcttc gtcaggaaat acagcttaca     300
acgtggaagt ggtgtccaag atgggacgga acgaatggaa caaacactgg gcaaagtgca     360
gatcgaggga ggtacgattc ttcagcgaca ggattctaca ccagccttta tcgtacatat     420
gaacggatga tcaatatctc gaggatggtc atttctacag tgccgaagat catgctgtgc     480
atccggatag ggcattcctt tctatacaga cgattgggtg tgggacacct atcgggctga     540
catccctgcg tattcttttg gagccggaga tggaatccga catggtcatt cctacattcg     600
tatggctttg cttagcaggg agaaatggtt gcctacctcc cggaagtgac aggcgacagc     660
catcgtatga atggcaatca tgctatgcca tgcttgccga tgcctatgcc aaaggtctta     720
cgggtttcaa tttgatgagg cgtatacggt agccaaaaaa gtgatggccg agaagacgta     780
cgcacttggc ggcgtatgcc caaaggcaca ctcgatcaat ttttcgatga gaaggctact     840
accccgcatt gccacaggac caaaaggaaa ccgaccctac caacactctt gggagaagcg     900
gcaggcagta gccgttacgc ttgctattgc tacgattatt ggtgccttag ccgattggca     960
cagttctccg gccacgagca gaagcgcgtg aatttctgcg taggagctac gactaccgac    1020
atctttacat tcggagacgg gattctttca tcccaaggat gagaagggac gcttcataag    1080
cccttcgatt acgaatttga tggaggcccg ggtgcacgag actattagac gagaacaatg    1140
cttacactta tcgctgggat gtacagcaca acctcctgat ctgattgcct tgatggatgg    1200
gccggaacag tttgtcagtt tcttgatcag actttccgca caccgatgag tacatgggaa    1260
gttcaatttt tattcaagct gcccgaccag acaggcaatg taggacagtt ttccatggcc    1320
aataagccga gccttgcata taccctattt atatgtctat gccggtcagc caggcgaacg    1380
cagaagttga tccatgagct t                                              1401
```

(2) INFORMATION FOR SEQ ID NO:453

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 3010 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...3010

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:453

```
gggcggatgg ttttaccctg ctctttgcca gtgatcgacc tgatggaatg gcggatatga      60
tctgtatatg acccgtcgtg atttggagga tggcattttc tggaaccaac tttgctcggt     120
atgcctttca attcccctta caacgatatc tgctggtgta cgacgaatta cgtgggatcg     180
gcttctttgc cagtgacgtt tttgtcctgc ggatgttgtc actgtctata ccttcgttat     240
caatgagaag ggcgccctgt ggctactgac gatatggccc tcaaaagagc gtatcatccc     300
tcaagagcat aagagcgacg caagaccctg agcgagacta cagcgtctga tcgcatcggc     360
tcgggacaac cgcaccgatg cagagaagaa ggttccgaac gtcagattta tttccctatg     420
caggggatgc gtatctatac ggctggagcg acttccaaag cagcgaagcc aagtcgctct     480
atcaggatgt atggctcgga aaagaaaatt ggaacaggcg gctacccgtc tggaagagta     540
cgactcttgt atggaagagc atcggctttg gagcgaagcg gtatgaagag gaaattcttc     600
gtctcgaaaa tgccattcct ccactggaag aagaagtggc cgaatggaaa aggaagtcag     660
aaacatggag ttacaagccg tgcaagcttt tagaccaagg ccgacctttt cgagagccat     720
cttacgattg atctgctcac ctcttaaaac attaatgaac ttatgaaaac caaaagaacg     780
attcccctc cgagctgatc atcaatacgg acggttcggt cttbcatctg catttcgtcc     840
cgaacaattg gccgataagg tcatattggt aggtgatcct gccgagtgga tgcagtcgcc     900
```

```
tctcgtttcg agcgtattga atgcaatgta tcaataggga gtttcatacc gtcacggggt    960
ggtatggcga caagcgtatc cggtgcagag ccacggcatc ggctctgata atatagatat   1020
agtcttgaag aactggatgc tctggccaat atagacttcg atacccgcca ggtgaaggtc   1080
ggctacgcaa actcacactc gtaagggtgg ggacttcggg cggattgagg acaatacgcc   1140
cataggatct tatgtggctg cagagcgaag catcggttcg atggagtcat gtatttctat   1200
agcgatacgg agaagatacg ggatgggcct tcgaagcagc acttcaggat caactggagt   1260
ggaaaatcga agggtgaaac cctacgtgat accggctgac aagacgctgt cggatcgaat   1320
atgcgggagg acatcctgcg aggtgtgact attgcagcca atggcttcta cgaccgcagg   1380
ggcgtcgctt gcgcttaccc ctcaaagacg aggatctgaa cggaagatac aggctttcga   1440
cttcaatggc agccgtatta cgaactatga atggaaagct cctctttggc cggtctggct   1500
gccctgatgg ggcacgaagc atcacggtct gttgtatcat cgcaggcagg aaatccgaaa   1560
agatgaatcc tcctatcagg gaagtataga gggccttatc gatttggttc tggaacgatc   1620
tgatagaaat aagttacctt tgtgaaccaa ggttttttccc cctcggcgaa tggctccgat   1680
cgtgtcggtt atgcagcaga gcaagcaagt tgctgagggg gaatataaat tagaagtttt   1740
tgcatgaaca tactcgaact ttcgaacaag aagtcgtacg ccgtaacagc ttagagcaac   1800
tgcgtaattt gggatcgatc catatcctgc agcggaatat accgtcaatg cctattccgc   1860
cggatcaaaa ggaatttcaa tggcgatgag aatgtcgcca aacgtcaagt agcattgccg   1920
gacgtattat gagccgccgt atcatgggga aagctacatt atggagctgc aagatgctga   1980
ggggcgtatc cagatctata ttactcgggc gatatttgtc cgggtgagga taaggagttc   2040
tacaatacgg tggtcaagag tgtacggata taggtgattt tatcggagtg aaagggtacg   2100
tattccgact cagatgggag aaatatcggt gcatgtgcag gagatgactt tcttgtgaaa   2160
gctatccgcc cccttcctgt ggtaaaagaa aaagatgggg aggtctcgat ggcttcacgg   2220
atccggagca gcgttatcgt cagcgatacg tggactggtc gtcaatagtc atgtcaaaga   2280
cattttcctc aagcgtacga tggattcaat tcgatgcgca gtttcttcaa tgagtgcgga   2340
tacatcgaag tgatacacct gtactccaat cgatcccggg aggtgcagct gcgcgtcctt   2400
tatcacgcat cataacgctc tggacattcc gctctatctg agaatcgcta cgaattgtat   2460
ctgaagcgtc tgatcgtggg cggtttcgat ggtgtgtata attcagccgc aatttccgaa   2520
atgaggggat ggaccgcacg cataatccga gttcacggcc atggagatct atgtggcgta   2580
taaggattac aactggagat gaactttacg gagcagatgc tcgaacgcat ctgtatggat   2640
gtgctggtac tactcagatg aaggtgggcg ggaaattgat cgacttcaag gcccctacaa   2700
gcgagtgacc atgatcgaag ccatccatga gcatacgggt atcgcatcag cggaatgaac   2760
gaggccgagc tgcgtcaggt atgcgacaag ctggcgtaga gcacaatgaa acgatgggca   2820
aaggcaagct catcgatgag atttcggcga gaagtgcgag aagaactata tccagcctac   2880
tttcatcaca gctatccgaa agaaatgtcg cctctgacga aggagcaccg caccaatccg   2940
agctgacaga gcgattcgag ctgatggtca atggcaagga gttggccaag cctactcgga   3000
gctgaacgac                                                           3010
```

(2) INFORMATION FOR SEQ ID NO:454

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 671 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...671

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:454

```
ccccgctcta tttcaatgca gcgaggtcga acggtttgag cttcaggcat ctgctccgtt    60
tgccttcttt ggcagtctca tgtgggagct gcttatggaa acgagccacc gagtatcaac   120
gacctctgtg ccaccaccat aggcggttag ctttggggga gatggggcac aggctgtcgg   180
acctgctcat cgacaacgta ccacagggtg ggaacgtatg gggcgcgagg tggctatcgc   240
tctgacaatc cgatgcgctt tctcaaccgt ctgacagcag gagaggtgac ttcttcggga   300
gtcgcagcgg acagatattt cagtctgtcc ccataaacat agtgtcgatg ccggctttcg   360
cttttttggca gacaagcggc atgcccgaac cgtgccacgg ctctgaccct gaatctgaga   420
```

```
ttcgactacg gcgatccatt cgaagcgaga ctttctctcc atacgatttc ttccaattca    480
aagccggatt agtttctccg aatcgcaacc tctgctgagc cagatcaatc tgatcggaac    540
ctaagcggat gccaactgct cgcacacgaa cgaacggttt tggtgggagg tctctttcag    600
cacttcgact actacaattc ggaaaaacga ataagcaaaa ttcgagggag gtactcgtca    660
cccataccgg a                                                         671
```

(2) INFORMATION FOR SEQ ID NO:455

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 590 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...590

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:455

```
gcatcagccg gaacataacc taaggagttg taccactccc aacctttgca cccgtggagg    60
agattttcgg atggacggct ttcgtagcat gcaagagtcg ttcatcagtg tacgggtatc    120
ttctacccga acacccttga ggtaggctcc gccagaacag aagcagagtt gttgcctatc    180
atacaatccc gatggccgga ctggcccatt cggggaaaaa gccactctcg cgatatacat    240
tcagcgacct tcctgaattt taatgttttc atcgggatac agcagattga gcaggggaaa    300
agggctcgaa aagtgtccca aaatccggta tcggtataga gataccggga agtacctctc    360
cattgtaggg gctgtaatgc acaaaattgc cgaagcatcc tcctcataga agcgacgggg    420
aaaaagcaga cagcgataga ggcggaatag aatgtagtgc gctcatcctt cgntcctcct    480
tcnacatgna gcgtccgagc accttattcc agcttcgcga cggcaagtct gatccggtca    540
aactctgccc tttgacttnc gcagatttct ttcggctgct cgacactgta               590
```

(2) INFORMATION FOR SEQ ID NO:456

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 997 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...997

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:456

```
tgcggctgta tctcttccaa tagagccatg atgatgcgca cgtcttcctt cccaaaggat    60
ttttcctgat caatcccgtc tcatagaaag gcagatcggg aaatgaacat gatcctccgg    120
caatcccaag tatctgcatg ccgtccggct tcttcgcgtc gtatggttcc tttcataaac    180
```

```
ctgatatcct cctgctggga tccccttcta tcttttttgtg catgagatag tgccgcacct      240
cttcccttttg gccagaatgg ggctgctctc atgaccgtat tggcggcata cattctgagg      300
tacgacacat atcgaatcac ttcttcatcc cccacggcta tatgccggag gtctggtagg      360
ctacatgtac atcgtggccc tgattgacca attgtggaat gttcctccca tcgaaatgac      420
atcgtcatcg gggtggggac taagataacc accctcttgg gatagggtag tgccctctca      480
ggcctgctgc gtcatcggca ttgggttttc cgcccggcca gccggtgatg gtgtgctggt      540
gtcgttgaag agcttgatgt tcacctcgta ggccgagccg tatttggcag caattcgccc      600
aatccgttct ccgtatagtc cttgttcgtc agcttcagat gggcttgccg gtcagtccgc      660
acagccatac cacagccctg cgtatggctg tttgttccag atacagctcg tcaccagcca      720
aggacgactg atcctgtgag acaagacgat gccgatagat ccagcacgat ggaggcattg      780
cgatcaattg cagggacgaa gccggagaag cctcgcaaat ctttccttcg atacttgggc      840
tattacctct gccttactct ctccccatgc cagcagggtc acttgtgagc tttttggatg      900
gtagccagtc ccatactgat agccgatggg ggatggtgtc gtgggagctg aatatcgtca      960
gagcatcgtt gtgctccgta ggccgagtac gacgagt                               997
```

(2) INFORMATION FOR SEQ ID NO:457

      (i) SEQUENCE CHARACTERISTICS:
          (A) LENGTH: 998 base pairs
          (B) TYPE: nucleic acid
          (C) STRANDEDNESS: double
          (D) TOPOLOGY: circular

     (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

     (iv) ANTI-SENSE: UNKNOWN

     (vi) ORIGINAL SOURCE:
          (A) ORGANISM: PORPHYROMONAS GINGIVALIS

     (ix) FEATURE:
          (A) NAME/KEY: misc_feature
          (B) LOCATION 1...998

     (xi) SEQUENCE DESCRIPTION: SEQ ID NO:457

```
cggcctggcg cagcagatag gaacggtcag cgatgatgag cagcaccacc gaatatcttc       60
ggcgatggag aggaggaagt gctcgaagtt ggccgtatga tagccgtatt gcgcatgtag      120
atctccgatg ttttcagcag gaggtcgtca ggcgagccac atcttcgccc atgagctcgg      180
ctatctcctc cggtctgtca gccccttcat cgccggacga tagaagagga gtgctccgat      240
ggccttatcc ccagcccgat ctcacaggag gctatgcgtg ccacttccat gttggcaaaa      300
gtccgtgcat accgttttttg tcgcgatcga aacatcccaa ctcgtaaaac ggctcagcag      360
actgcgtact ttcttcacga gctgccgatc ggagctagtg tacgaatcaa actcgcgtat      420
gaggagagga agcgactccg ccatcggcgg agaaaagagt attgtcgtgt attgtcatga      480
gggatacagg tgggataatg aatagtggac gatggatcat acttgtagtc ggaaagcatt      540
cggttagagc agaggagaga aaaggcgaac aaaggattcg ctgaattttt tatccggctt      600
ctctttcgcc agcgtttgag atcgagcggt tcgctctcaa caagtcctcg aagaagatgg      660
cttccaatcg gtggacagta ggctcgcata gatgatacca ttgaattcga agttatttttc      720
caagctgcgg aagtcatatt cgtagagccg atcgaagcca cctgactatc caccattatc      780
agctggaatg gagaaagccg ttggtataga ggtgtacatg tacaccggcc tgcagagatc      840
ctccacatag gagaaggccg ccacttgtgg cagacgggca tccttcgttt gggcaccagc      900
aggtgtacat cgatgccggc caaagctgcc ggatgagagc attattcagt ccttcggtcg      960
gaaggaagta aggagtctcg tatagacatg ttcgcagg                              998
```

(2) INFORMATION FOR SEQ ID NO:458

      (i) SEQUENCE CHARACTERISTICS:
          (A) LENGTH: 1285 base pairs
          (B) TYPE: nucleic acid
          (C) STRANDEDNESS: double
          (D) TOPOLOGY: circular

     (ii) MOLECULE TYPE: DNA (genomic)

(iii) HYPOTHETICAL: NO

(iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
    (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...1285

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:458

```
ccgctccttg aagactgtgt tcatcgccaa cttcacacaa tctaccggct ccccgtacag    60
ctgtataccg tatagccttc ctctctgtgc cgaagcttag cttgatgggg agagtagagg   120
taatggcagc cgaagccccg gatcgtgccc gtcgggagct acgatcgtga cattccctaa   180
tgggcgcagg gcttctccag ctcgcggata ccctgtgctc gaaaaccatc gtcattcgaa   240
actaaatttc aatcggatcg gctttcattt cttgtcttct tcaggaataa tgcccttagt   300
tttacgataa aacgtagtgc ggaataggag gggatgggta cgaatttgcg ctcgatgcag   360
ggacgccttt gcttccatag gctaaatacc agggacgatg aactcacact cgtctccgat   420
aaccatattc tgcaaagcaa tcggaagccg gtgatcgact tatccttctc attcctgtaa   480
agtgtgatac tgccggcttt tcggagttat agtttccatc taccatgata tttcttacta   540
acgatacgtt tggtagtgga cctccacacg ggaggtggcg atcggatgtc tgtacccgta   600
ccgtttgtta tccagcgcat gtaaacgtat gcggtcgtcc atcaacagat actttcttga   660
agttggtgct gtccgcatag gcgttgaggc cacttcgttg tcgtgacgac gctgtttttc   720
ctcattcggt cttttttcgca cgaggagaaa acaaggaaga tgtttaccag catcagccca   780
agggcatgat gatattcttt ttcgtttttca taggtctatc tttttgagca agccttgagg   840
cttacatatt ccgagataat agcattcaaa cggctgatct cccacgctcc tgctccatcg   900
tgtcacgata gcggatggtc acggtattgt ctcgagcgat tggtgatcta ccgtgataca   960
gaaaggggta ccgattgcat ctgacggcgg tagcgtttgc cgatagaatc cttttcatcg  1020
tattggcagc gaagtcgaaa cggaggtcgt gaacaatctc ccgagccttc gcatcaagcc  1080
atccttccga accagaggga gtacggccaa cttcacggga gccaatgtgc gggcagcttc  1140
agcactacgc gcatctcgcc gttggaagtc tcttctcgca atacgatccg aagagaatcg  1200
tcaggaacat ccgatccagt ccgatgaggt ttccactaca tacggcacgt agctcttggt  1260
ctgttcggga tcgaatactg cagtt                                        1285
```

(2) INFORMATION FOR SEQ ID NO:459

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 1116 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...1116

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:459

```
accgttgctt gaacgccgtn nctagagnat cccctatgcc gatggatacc ttcgccctta    60
tcatgcgcag atcggggtct tctatcctct tcagacatca gccgcgaacg tcgtgtggac   120
tattcttcca tacctatata tatagaagta acgacgaatc cgtggtacga ctactggaat   180
ccgtcgctcg tcttatagca ggaacgttct ccgctgtaca tcggagcagc gactctatct   240
gcactggctg ctgtatttgc ctgcaatttc acgaatcatc tctatgcctt gagtagcaaa   300
tgctggccgc acatggnctg ccgccacgct ctctggctcc tctatcgcag agactgcggc   360
caaggtgcag gagatgtccg ccaccgaagc tcgaccgggc cggccaaaag agacgacaca   420.
aacactctgc aaaaacatct cgtctgctca acccatatcc ggattggcag gagatctatc   480
```

```
ggatacttag gatagcattc ggaagatgta cggaccgaaa gaacaataaa ccccatttta    540
tctcatgagt agtattccat tcgacctgaa gtccatacgg ggattcgttt cgatgtggac    600
ggagtgatca gccataccgt ttcggctatg gatgccgagg ccagcctatg cgaacgatga    660
atgtaaaaga cggttatgcc atgcaaatgc cgtcaagcaa ggcttcttgc tggccatcat    720
cacaggcgga tacagccggn catagccnaa acgggcagaa tatctcggca tcaaacatgt    780
ctattgcgtt cgtccaacaa ggtggagcag ctcgaacacc tcctgcagga gacgggttga    840
aagccgaaga gatagtttat ataggggacg atatacccga tcgccggtga tgcaagaggg    900
tggctttgcc cgttgccccg gcggatgcag tccggagatc aaacaggtgg ccaaatacat    960
atcgcactgc cggggaggag gggcgtcgtc cgcgatgtca tcgagcaaac gctgaaagca   1020
caaggccgcg ggcacagggg aatgggttcg gatggtagcg gacggaagtc ttcttgatga   1080
aaaatcttgt ggtttatgct ggacaatctg aagaaa                            1116
```

(2) INFORMATION FOR SEQ ID NO:460

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 1017 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...1017

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:460

```
agaagcncac tccggtagcc gaagtttcgc ccatgttgcc gaatcccatg cctgtacgtt     60
cacagccgta ccccattctg ccgggatacc ttccatgcac ggtagaggat ggcacgctcg    120
ttcatccaag agtcgaacnc ggccatgtag cacccaaag ctgctcttcg gcagagaaag     180
ggaagtcctt acccgttgag cctttacggc tgccttgaaa cgggatacna ggtctttgag    240
gtttttacgg agagttcgtt gtccaagtgc acaccattct cttccttgac cttccgatta    300
tttcttcgaa cggatctata tcttccttat tcgtgggctt catccgagta ccacgtcgcc    360
gtacatctgc acgaagcgac gataagagtc ccggcaaatc gttcgttgcc ggtcttgcgt    420
acgataccgg ccaccacttc gcgttcagac cgaggttgag gatcgtatcc atcataccgg    480
gcatggaagc cgtgctcccg aacgtacgga tacgagaaga gggttctcgg tgtcgccgat    540
ttcgacttca tcagtccctc gatatttctg atcgcatcgt ttacttcgca cgcagcagct    600
ccactacttt gtctcggccc aatgtatagt attcctgcaa acctctgtcg tgatcgtaaa    660
accgggaggc accggcacac cgataaattc atttcggcca aattggcacc cttacctccg    720
agcaggttct tcatcctgct tctccctcgg ccttcccatt gccgaaggtg tagactcttt    780
tctttccatt tagattagtc cgttcgttat tattatgatt tggatagttc ttattatgac    840
aaaaagcgat aaccgactcc ttctccgagc ttccggaagg ggcgttttt gttgtaaact     900
gcaaattaac gaaaaaagag caagatacgc tctttccacc acccctcaaa cccatgaacc    960
tcaaggagta tgggacagaa agtaggcgaa gcatgctata tcacaggaga aaaagac      1017
```

(2) INFORMATION FOR SEQ ID NO:461

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 2408 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
         (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
         (A) NAME/KEY: misc_feature
         (B) LOCATION 1...2408

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:461

```
cctgtgtagt ttggtggata gacctttgtt gatagagatt ccggtggcac tttcgtctcg     60
tatgtgtcgt taaagaaccc atcgatcttg gatatcgaag atccggctcg aataccactt    120
cgggtacgtt cggacggttt ccattgctcn taaatcgcgc ctgaccattg tgagagaaag    180
agcgttccaa tatatttcgt ccatataagt attcccttcg gcgaggatat tttccacgcg    240
tttggcgtct ctatggcctt gtcgttgtat ccgtagcgtg catcgcctcc tgtataaggg    300
cagaggagaa ttcgacactg aagttgccgc ccagcatcga cgagacgtaa cacctccact    360
attgccgaag ccgcgtcgac caccgccttg ggagagaaga aggtcatgga tcccatctcg    420
ctgtccatct cgctaaagcc ctattgttcg tattgttcgc actaccgatc aatgtccatt    480
gcttatttcc tcgaaccgat tgacgttccc tccggccata tagcgttggt cggtaccgtg    540
ccggcctgaa gcgttccgaa gaggcctttc ttttttcgg gcttcacctc aggttgatta    600
cggtctcctc ttctccatca tcgaaaccgc tcatccggac agctcgctca gtttgttcag    660
tacctgtact ttattgacca tatcggcgga agattcttta ttgccacctg tggatctttg    720
gagaaaaact ctttgcatcg acaaggatct tgctaatgtc cttgccgttg atggtgatct    780
tccctcggat ccgatctctg ctccgggtag cttcttgatc agttcctcga tagagctccc    840
tgtgctacgg tataggatcc ggcattgaat tcgagcgtat cgtgcgtacc acgacctctg    900
ccgctttagc ctgcaccgtc acactctgta gagacgggca tcttcgttca tggatatatc    960
tttgagcgta atggtttgcc gtttctaaga gatatttttt cgtcgtgggt agtgtaacct   1020
acatatgaac gcgcagaatg tagtcaccct cctgtgacgt tttcaggctg aacaaccctt   1080
ttcattagtg gcacctgcgg caacggctac ttggccggta ctctgtaaag ctgtacgttg   1140
gcttgaatca tggggttgcc ttcttcgtcc aatacttacc tgctactccg gcttgttggg   1200
cttccagccc gacgaaacca agagagcaag gagtattgac aacagtaatt gataaatcga   1260
tcgcataaga aaagttgaaa agaaaaatag gtgctatcgt tcccattctc cgaaatggta   1320
tttacgattt accctacaac tgaaatagag aggaaaagag aaataagttt aaagaccatg   1380
tcgattttcc acattcggac ctccccgcaa ctgtcgggaa aggcgacaag tatcaaggag   1440
caagtcggat ggcattcttc tttggtatta ttgcctcaag ggagcaaaca tgtatctatt   1500
ctatatattt ccgctcatga aaaaggtgaa gaaattccgt cgaaaagtag tcgcttacag   1560
agaaatcaga acgaaaaatg atgagattgc ggtgcgattt ttggggaaaa tacgcgctaa   1620
attttttcgt tttggttcgt aatttttttga cttctcgcgc caaaacaaaa atttctcgcg   1680
ccacgttttt acgatccacg cgcgagcatt ttttcgacgt aaaaacgtcg gagagggaaa   1740
tgccctccat ctgctgtttt ttcgtcccgc agtggaggaa aagctcggat ggaagagcct   1800
tcgggacaca gaccggggag ccgtctttct ccaaaaacac gtatctttcg gagattttag   1860
ctcaaccgcc cgattattat gaagcatttt ttcagtgcta tacgccgttt ctgccaccct   1920
ataagaagta tgtggcatgg agcgtggtgg ccaatacgct agtgcactgc tcaacctatt   1980
gtctttctct ctgatcatgc ccatcctgct atcctcttca ggatagaccg gcaggtgacc   2040
acttacatgc cgatggatgt atagactggg gtagcatgga tggctggaaa gctgccggag   2100
ccgctctagc aataatttca gctggtacgt aagccaactt atagaggtac gtggagatcg   2160
tttacgctta tcatgctggg gatttatctg gtggtgatga ccttttgaaa gtggcttcga   2220
tgtacctcgg attctacagc atgattccgc tgcgacggga gtggtgcggg acattcgcaa   2280
tcagatcaac gataagatcc tcgactcccc ctttcctttt tcagcgaaga gcgcaagggc   2340
gatatcatgg cagcatttcg ggggatgtga atgagataga gacttcggtc atcagttcgc   2400
tgatatgt                                                           2408
```

(2) INFORMATION FOR SEQ ID NO:462

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 487 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:

(A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...487

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:462

```
actgctgctg tagcacacac aagcctatac cgatcagaat gccgatggcg cccccgtcat      60
ggagacgagc agtccttcta tccgaaagat acgagagagg tttgggatgt tgctcccatt     120
gagtgaagcg tatagatgtc ttccttcttt ctataaggag catggagagg ctgctgacta     180
tattaaatgt agcaagacaa ggataaacag gaggatcagg tagctcatcc acttctccat     240
cgctacaagt gagtgatttc gggatgctgt ccggccaaat cgagtacttg gtagtgtccc     300
ccagagtctc ttttaggcgg agagctattt gctctgcatc gctcccgttc gtagctgtat     360
ggccacggct tctgcttcat gatccgaata ataagcagat tgcgcagact gtctatggaa     420
aggatgatgg aattgtcctc tgttgcaggc cggatgcaaa taccgatgcc acttgccttg     480
gagcgac                                                              487
```

(2) INFORMATION FOR SEQ ID NO:463

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 483 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...483

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:463

```
tttactgccg tatcagtatc cgcggaggat tcgtttgatg tcgttcagct attgagggcc      60
tccaaggggg tgaggttgtc gatgttcaga tcgaggattc ctctctgatt tgggacaaga     120
cgggatcatc gagctgaaag aagctaactg ataaccgtcg atgctcctgc cttttttcgtc     180
ccgaggaagc gtgggcacgc attttttcacc tttttcggaag ggcctcgttt ggtgtctttg     240
gtttttggctc ctcttcctct atttttctccc tttcttgttc gagacgatgc aggagtctgt     300
ggctcgctgt acgatatggt gtggcatacc gccgagacgg gctcttgaat accgaagctg     360
tgtgcactgc cgcccggctc caatttgcga agaagagcat cttgccgtcc acttcgcgag     420
ccgatacatt gaagttgggt accganncga gttgcccttt ccagctcgtc agttcgggat     480
aat                                                                  483
```

(2) INFORMATION FOR SEQ ID NO:464

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 726 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:

(A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
     (A) NAME/KEY: misc_feature
     (B) LOCATION 1...726

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:464

```
tttttattac aactttggag cgaatttttt caagggcaga ctcgggagct tgttttccac    60
gacctttcaa cgtagagccg actgcttaat cttattttaa acaggaacag aaatatgtcg   120
aaaaaatcga tccttctgct ttgctgtcgc tgtgcttcat ttctgctacg aaggctgtga   180
cccccgtcag aaatgtcgca atagccaagt gaacagcaaa gcaaagaccg aacgtacaaa   240
gccctggact ctgtacggta cattagcaac atgattgcag atcggctgga gttcgcaaca   300
agatttcttc cgaaaaagag gtaagaaaag ccgaatatga aaacggctgg cgatggaagc   360
actcaattac cctgccatag atttatatgg tgagattctt ggagcgagta tgtaaaccct   420
ttcgtgggtg caggaaccga ttcgaaattc cgaactccta tgacattgat tgctcttcgt   480
tcgtgatgcc gtcgaagata agcaggtcac ctctcaattt ggctaccgtc ggcgtttcga   540
cggatgcact atggtattga tctttcagtg aatcgtggcg atacgataga gcagcctttg   600
acgggaaagt tcgtgtacgc agctatgaag cgcgtggtat ggctactaca tagtcttgcg   660
ccatccgaac ggactggaga ctgtgtccga cacatgagtc gccaattggt agacgagaat   720
cagatc                                                              726
```

(2) INFORMATION FOR SEQ ID NO:465

     (i) SEQUENCE CHARACTERISTICS:
         (A) LENGTH: 591 base pairs
         (B) TYPE: nucleic acid
         (C) STRANDEDNESS: double
         (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
         (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
         (A) NAME/KEY: misc_feature
         (B) LOCATION 1...591

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:465

```
tcgaacaaaa agtcaaagaa tatttctgca acatcaatgg atataatgaa gcaatatttt    60
ctggttgcat aacacactat ttaggcaata atagcctatt attagttgcc ttggggctgc   120
tattcctgta attgcaggaa aattcatgag aatgagactt cttccgaaga aatgagctat   180
gaagaattca aaaaacgctc tttgagtgca gcgaggtaga tgacctcatc aaacttatta   240
ataaacgggt tattgccgtc cgataaaagt tgtttgattg ctcaccagct tttgtgatat   300
aaaaaagcag gtatcgatcc tccaggatcg atacctgctt catcaaatta aatatcatct   360
tatcccatta ttgaactatg acgagggact aactcttgct tcttgttgaa gttaaaagtg   420
atttgttgca ccttgccgaa gtatcttcta tatatacgtc taaagatatt ggtgccggca   480
tttcatcccc ttcgtcgcca ttttccctcc gattggattc ggtgccggca gaagtttttc   540
ttccgtttgt aacaaatgga tcctttgca tcttcatata tacagggctt c             591
```

(2) INFORMATION FOR SEQ ID NO:466

     (i) SEQUENCE CHARACTERISTICS:
         (A) LENGTH: 416 base pairs
         (B) TYPE: nucleic acid
         (C) STRANDEDNESS: double
         (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

(iii) HYPOTHETICAL: NO

  (iv) ANTI-SENSE: UNKNOWN

  (vi) ORIGINAL SOURCE:
     (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

  (ix) FEATURE:
     (A) NAME/KEY: misc_feature
     (B) LOCATION 1...416

  (xi) SEQUENCE DESCRIPTION: SEQ ID NO:466

```
tgaatatagc cgctgccgta ggctcgctgg cagtaatggg gctgatcgtt ttgtcagcac    60
caaggtgcgc agccacgtta cgctgctcat tatcggcgta tgatcggata tgtagccact   120
gccgtcatcg gggtattcaa gtttttcgta tcgaagaaga tattcgggca tacgtaattt   180
ggggggttggg cagctttccc gtgccacgga ttcgcaactg agtttctttg ccattctgat   240
gttgacttta ttccggccgg tatgctcctt gtcaagcagt tgaatctctt attgtgggag   300
aaagctacgc acgtaatctg ggactgaata ctcgtcgggc acgctgctcg tgatctcttc   360
cgccggtttg ctcatcgcta ccggaacggc ctttgcggcc catcggcttt ttgggg       416
```


(2) INFORMATION FOR SEQ ID NO:467

    (i) SEQUENCE CHARACTERISTICS:
      (A) LENGTH: 664 base pairs
      (B) TYPE: nucleic acid
      (C) STRANDEDNESS: double
      (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
      (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
      (A) NAME/KEY: misc_feature
      (B) LOCATION 1...664

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:467

```
tagaggatcc ccgcaaaatt cattcataaa atggaaattt tattgtttgt gaagccttat    60
tatatttgac taaagttaca gaactatata tgaatattgt tacatacagc cagatatgaa   120
tagactcaac tggacgcttt ctgcactatt gaattatcca cttttagaga ggatgatttg   180
ttttctatgg aattaacaat ttgcatgaaa ctgtcaagaa agaaatcttg gaatacttga   240
gtgattagaa aaaggaccaa tctttacttc taaaattcga gagataaaat caaatttgaa   300
aattcttttg tcgatattga ggagcataag gataatttgt tatagaagca aaggaaatac   360
ataaaagcac cttggttcga tttgagaaag ataaatgttt gtgattgact ttagaaatgg   420
aaatctcgaa ctttattcat caatgaccaa tgaccatggc gaatgagtta tgtatggctt   480
ctgttttttt tcatatcgtt tttagttgaa actacagaga aaaatgaatg aagtacctgg   540
attaagaaaa ggacgcttga agtcttattg gaatacagct tttaaagggc tttttttctcg   600
gatattcgtg gtcctggctg cattgacaag cagaactgtg gactcttgct cttcggctga   660
tgat                                                                 664
```


(2) INFORMATION FOR SEQ ID NO:468

    (i) SEQUENCE CHARACTERISTICS:
      (A) LENGTH: 2198 base pairs
      (B) TYPE: nucleic acid
      (C) STRANDEDNESS: double
      (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

(iii) HYPOTHETICAL: NO

(iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
  (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
  (A) NAME/KEY: misc_feature
  (B) LOCATION 1...2198

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:468

```
attctaactt ccaagattga tcatgggctc aatccagata cacatgccat tttcagcaaa      60
ggccctgtac ccggtcgtcc ataatttggc acctccggga ttcatgcatc tgccgaccga     120
ttccatgtcc gaccaactct cgaacgaaga gtatccacga ctttcgcagt acttctgtac     180
tgcactgccg atatccctat tcgatagcct tctatggcaa cagcaattcc ttcgtacaac     240
gactcttcgt cgttttcaat agtcgaatta cttccggagc aacttctcct acagaaacgt     300
ataggcagaa tctcctgtaa atccattcaa ggatgtaccg cagcgactga tacaatatcg     360
ccttctttga tgatagcttt agcagaaggg atccatgaac cacattctca ttgaccgata     420
cgcaaatact attggggaaa caccataacc aaggaaagcc ggctcagctc catggtcacg     480
aataaattcc ctgcgacctt atcaagcatc aaggtcgaaa cacccggccg aatattttg      540
caacttcggc cagagtcttt ccaaccaact gatttgcttc gcgcatcacg cgatttcttc     600
atctgtcttt aggtaaatca tcaatatgcg gaaacaggcc aactctacct ttaatacgcc     660
cgctcttcaa caagccatcg taatgttcat caagagatgg ctttcgatct gttgcaacgt     720
atccaaaaca actccaccaa aatcagcaga gaagttcctc cgaagaattg cgcaaaagct     780
gaacaactcc gaacatctcc gcaaaagcag gcaggatggc aactatagcc aaaacaatgc     840
tccaggaagc gttatccggt ccattatcgc atcaatataa tcttcgtttg ttttccgggc     900
ttaataccgg gaataaaacc gttgttcctc tcaggtcatc ggccatctgc ttaggattga     960
tcgtaatcgc cgtatagaaa tacgtaaaaa gaatgatcaa aatagcaaat acaagattat    1020
accaaacact gtgttgttag acatagcact cagaaacccc gaagactgat ctacattgcg    1080
aatcccaaaa tagagatcgg aatgaacatc agcgcctgag caaagatata ggcatcacat    1140
tggcagcatt taccttcaag gggatatatt ggcgtgtccc ccatactgct tattaccgac    1200
aacccgcttc gcatattgca caggtctttt cttgttcctt gtaccaaaag gattgcacct    1260
gctatgacaa aaagaggaat acaatctcag caagaaaagc aaccaaacct ccaacagcac    1320
tcgtgtgcga gatgtgaact cagctacaaa tgcatggggt aaacgagcaa tataccgatg    1380
agaatgatca acgaaatacc attaccgata cccttgtctg tatacgctct cctaaccaca    1440
gaacaaacat actaccaccg gtaagaatag aaccgcaact atctggaacc aaaggccacc    1500
gggcatcgat gctcctacaa ctgcatttgc actcgcaagt tcaccaaata ggtaagagac    1560
tgtaaaataa aatagcaaca gtcagataac gagtccactg attgatcttc atacgccact    1620
ctcaccttct cgctgcaact tttgcattgc aggtacagca atcgctccaa ctgcataaca    1680
atcgaagcag agatataagg cataataccc aaagcaaaat agatgcatgg gagaaagccc    1740
ccccggaaaa catatccaag agagcatcag tcctccagca gtctggtctt tgagtgctga    1800
caacgatgcg gggcaatacc ggggatcacg gaccaaatga acccaaagcg ataaacgacg    1860
gaggaacaat aatggtcgtg agaatgcgtt gacgcaaaat cctcaatctt catatattct    1920
tgattgtttc taccgcacgc attaagctta tagttttaca cagatcctcc tgctcttaca    1980
atagcttctt ctgctgtctt tgagaaagct gagcttctac tgtcaaagcc gtagtcactg    2040
taccattagc caatatctaa ctaaagagtt tcgagaaaca agccctgcag caatcaagtc    2100
ctctaccaaa tcttggtcag agagttagcc tcagacaaag tttgaagcac agacagttga    2160
taggcttgta ttctactcga tttatattct taaagccg                            2198
```

(2) INFORMATION FOR SEQ ID NO:469

  (i) SEQUENCE CHARACTERISTICS:
    (A) LENGTH: 1129 base pairs
    (B) TYPE: nucleic acid
    (C) STRANDEDNESS: double
    (D) TOPOLOGY: circular

  (ii) MOLECULE TYPE: DNA (genomic)

  (iii) HYPOTHETICAL: NO

  (iv) ANTI-SENSE: UNKNOWN

  (vi) ORIGINAL SOURCE:

(A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...1129

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:469

```
gctttcttac aaggaaaagg ttgtatctcc ttgtctaata tgctctcgtc ctcttcgttc    60
agcagagacc aaacatctct aagcaagtgt cccaatcctt atccgaagct gtcttccaca   120
tataagtgtt cagagaatgt ctatttgtca aatccgtaca acgaggaaga aaggccgtag   180
aactattatt atgagaccgg cgaagaatcg aggggaaagt gcttctctat caatatcttc   240
catcctgtat attgcaaaaa taagtctgaa agtcggaata accacaaaat aaggggttac   300
ttatccggaa atcagtaaaa aataaaataa tcagagcagt gtcaaggaga aaacctccga   360
cacagccctg attatatcgt ttgaggctat ttccctgtgg aactattccg atggtgcttc   420
ttccattgcc ggttcggctg tggcacggaa aggaaactct tacgctcggc tgtcgccttt   480
tcgtaatcgt acgatgcata acgacgagct tctcgtaatc gcgcaaacca gtaccggccg   540
aatgaggtga ccgcagataa cgtttttctt cagtccttcc aggtagtcgt cttaccacag   600
atagctgctt cattcagcac cttggttgtc tcttggaaga ggccgcggac atgaagctct   660
tggtctgcag tgccgcacgg gtaatacttg gagtatctgg ctggcagtag ctgacttggc   720
atcgcgcact ttcacatctt gagatcctta cgcttgagca tactgttctc atcacggagc   780
ttgctgccgt aacaatctgt ccggctttca gcacttggct atctccggca tcataactac   840
cttcttaccc cagatgcgat cgttctcttc cattacttcg aattatcgac tacctgctgt   900
tcgaggaaga gggtgtcacc cggatcgaca attcaacctt gcgcatcatc tggcgaacaa   960
taacttcgaa gtgcttatca tgatcttcac accctgaagc ctatacacgt cttgtacttc  1020
attgacgatt actcctgtac tgccgtggga cctttgattg ccagaatatc agccggagaa  1080
tagcttccgt cagaaaagcg gtgttcctgc acgaaacgaa gtcgtttct             1129
```


(2) INFORMATION FOR SEQ ID NO:470

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 2443 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...2443

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:470

```
ccatactttg tcacttgcta tatatcgttg ccgccgcaat cctcacggct gcaactcaag    60
caatgcagcc cttcagtcgg gagcggagnt aaaacacgac atcaggaaga ttacgaccat   120
gatggagata aagcagagaa aaaatcccat cggccaatga gattcacttc tcatgccggc   180
aggctgaagc agtaggttgc aggtagagga agtggcacct gcctctttca actatgtgat   240
caaaaaagcg gacagatcct ctccgcccaa ggcgatgaag ccaccatagc agctcggcca   300
acggcatcgt ttcgtttgcc ggttcggcct ttacagaagg agctccgtac gagcaggaga   360
gtgcatcgta cgcatctctg ccaaaaatct gcggatggag atcccgtaac caaggcaaag   420
atcgcttacg aatcggctca aaggaacacc ggcgggctga aaagctggta aaagatcaga   480
tcatttcgaa aaggaatacg aacagacttg cagggactat cagacagcca agaccatatc   540
gaagcccaag catccggcac cggtgcggga ggggtcagcg tggcgtctct atgagcggat   600
atatcaaaaa ccgcatggtc aaccagggcg aatacgttcc gtaggccaac ccatagccac   660
cgtgtcacaa aaccgccggt tgcagcacgg gcggaggtat cggagagcca tttcaagaat   720
gtccgcaatg tctccgtgcc aacttccaga cttcatacga caacaagctc tacgagctgt   780
ccgactgaac ggaaggctgc tctcgttcgg gcgtgcatcc acacagtcat cctcatcccc   840
gttacattcg aattcgacaa tgtgggcgat gtcgtacccg gcctttcgtc actgtgtatc   900
tgctctccaa tactcaggaa gaagttctct cgttcccgta tcggccatta ccgaagagca   960
```

```
gggattgcac ttcgtctatc gcggttggcc gaagaggagt atcagaaaca agaggttacc    1020
ctcgggcagg caacggacgt cgtgtgcgaa tcctgtccgg actgaaagcc ggagacaagt    1080
tgtgactcat ggagtatatc aggtgaaact ggccgctact tcgtccgaat gcctgaaggt    1140
catactcact aaagagagag gatattcgat catgctaaca agatcattcg gttctctctg    1200
aacaaccggc tgaccatatt ggtagatccg tactgctgat gctggtcggc acctatacgg    1260
cctccaatat ggagtggacg tattccctga cttgaacgct cctaccgtcg tagtgatgac    1320
ggagntaccg gtatggcacc cgaggaagtg gaacgcctcg taaccttccc cgcgagacgg    1380
ccgtcaatgg agctaccgac gtgcgtcgcg tgcgctcgtc tccactacgg gcttctctat    1440
cgtttgggtg gaattcgact gggggacgga atttatcgtg ctcgtcagat cgtgtcggaa    1500
aagctggcca tggtcggtgc gatctgccgg acaatgtggg caaacctacg ctcggccccc    1560
aatcctcctc ctcggcgaag tcatgattat cggacttacg gccgacagca cctctctcaa    1620
gacctccgta ctttggccga ctggacgatc cgtccgcgct tgctctgatc ggaggtgtgg    1680
cacaggtgac agtactcgga ggcgacatca aggaaatcag atactgctca atcccgaaag    1740
gatgaagcac tacggtatca cgctgccgaa gtacgtgctg ccgtcgacca aatgaaccgc    1800
aatgcatcgg gtgcgtactg tatgaatacg gcaacgaata tatcatttgc ggactcctct    1860
cccgaacgat gctgccgcat tgggtaagac actggtaaaa agtctcgatg aattcccatc    1920
atgctcgaaa gcgtggcaga ggtaagggtg ggcaataagg accgaagttg ggccttgctt    1980
ccgagcgagg acaatctgcc gtactcgtgc catcaccaaa cagccggcga cgagtacact    2040
ggagctgacc gaaaggttga tcgctctctg gccgatctgc aaaaggctct cccctccgat    2100
gtgaaaggag tacagacata ttccgtcaag agcgtttcat cgaaaattct atcagcacgt    2160
acgaaaagct ctgtacgaag gaggcatatt ccgtcgtcat cgtatattca ttttcctgat    2220
gaatgctcgt gccacgaatc atttcgctgg tcacattccc ctttcgctgg ttgcatcctt    2280
tttgacactc aaactgatgg gacgaccatc aatacgatga gtctcggagg tatggctatc    2340
gccatcggtc gcggtggacg atgccatcgg gacgtggaga atgtatacaa acgcctgcgc    2400
gaaccgtatg aagcctgcga agaacaggac acggtgctca acg                      2443
```

(2) INFORMATION FOR SEQ ID NO:471

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 2971 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...2971

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:471

```
gactaaggaa ctgctcgtcg actttagagg atcccccggt catgcccgtc tgccccattt      60
tggcgatcat gatacgcggc tgacggcctt ctttctttca aacttctctg ccaattcttt     120
ggcatgggcg aagtctttat cttctccgat tcggatgagt acacgcctga aatagttctg     180
attactgctt tatatctccc acaaccttct cacatgcgtc cgagatctca cccaaagagg     240
cacgcgccct gcagctttga ccgcaaggtc gagcaggtta ccctctttcg tctcacgcat     300
ttggtgatag cctcaagggc ttcttgcacc gctttctcat cacgtgagag cggagatcgt     360
tgaggcgctc tatctgctgc ttacgaacag cctattgtcg atctcaagaa tatctatagg     420
atcctcctta ggcagacgat attgtttacc cccacgataa cctgctggtg cgagtcgata     480
cgagcctgtg acgggcagca gcttcttcga tacgcagctt gggtagtccg gtctcgatgc     540
ttttgccatt ccgcccatct cctgtacttc cttgatgagt gtccacgctt gtgtacgagt     600
tcgttggtca ggctttccac atagtaggag ccaccccggg atcgatttcc ttgcagacga     660
gagtttcctc ctggatatag atttggtatt acgggcaata cgtgccgaga agtccgtcgg     720
cagggcgata gcctctcgag agcattggtg tgcagcgact gggtatgccc caaagcggct     780
gccaagcttc gatacaggta cgtccgacat tgttgaacgg atcctgctcc gtcgcgacca     840
gcctgacgtc tggctgtgtg tgcgcagagc caatgacttg ggttcttcgc cccgaagctc     900
ttcacgatct tggcccatag gaggcgtgcc gacgcatctt ggcgatctcc atgaagtgat     960
tgacgccgat ggcccagaag atgagagacg aggagcaaaa gcatccacat cgataccggc    1020
atcgataccg ctttgagata ctgcataccg tctgccagcg tataggccat ttcgatgtgg    1080
```

```
cggtggctcc tgcctcttgc atgtggtaac cggagatcga gatcgaatga acttgggcat    1140
attctgagag gtgtactcga agatgtcggc aatgatcgca tcgagaattc gggcggatag    1200
atataagtgt tgcgcaccat gaacttttga ggatgtcgtt ctggatcgtt ccggccatct    1260
cttcgagctt tgctcctgct ccagtccggc attgatgtag aaagccagga tgggcaaaac    1320
agcccgttca tcgtcatgga aacggacatc ttgctcaatg gaataccgtc gaaaggactt    1380
tcatatcttc cagcgagcaa atggaaacac cggccttgcc gcatcgccca ccacgcgcga    1440
atgatccgcg tcatagccgc ggtgcgtggc aaatcgaatg ccacggacag acccttctga    1500
ccggaggcca gattgcgaca tagaaagcgt tcgactcttc cgccgtagag aatccggcat    1560
actggcgata gtccacggac gcatgggata catgccgcta taggggcctc gcaggaagga    1620
ggcagaccgg atacatagtc gagatgctcc atgccttcaa ggtcgtcttc gtatagaggg    1680
gctttaccat gatttgctcc ggagtacgcc agtcaccacg atgccctttt cttccgccca    1740
gcgcgtagca tccttagcca cgaaccggcg gacttaatat cgatgtcttt ataattaggt    1800
ttcatctttg attttttgctt tagggatgga tactaccgaa taccgaattt gtcgttgaag    1860
gccgaagcgt ttcgaggaca ttggacttca catgcacata attccggatg ctttggcctc    1920
aagatccgcc atacaagccg gtgcaccggc cactacgaac cggcacggcg ggcaaggata    1980
gtcgaatgca gccggagcgt actcggcatt tcatcgtcac tggagcagag caccacgata    2040
tcggcttttg ctgccaatcc gcatccacac cttcctccac ggacttaaag cccaaattgt    2100
cgatcagttg tagccggcac agccgaagaa gttgcttgag aactgagagc gtgccaacgc    2160
atggccagat tgccgatagt gagcatgaag acgacgggcg ttttgcgctc ttttccgttg    2220
cgagacggag agcttcgaat tcggatgctc ctcgctgaag ttcaggggtt cgatggattt    2280
gacacagtta cagtcatgct ctcctgagca agagtgatct tgtcgccggc aacttccgtg    2340
aaattgggga acggttggtc ccgaggaaga tctcgcggcg agtcgccacc gactggtggc    2400
gttgatattg cttgcattga cagccttctg aatgcttgct gtctcagcag ctgagtgaaa    2460
ccgcccgcat cctctacgga gaggaacagc ttccacgctc ctctccaatg gagttggtca    2520
gcgtctcgat ataataagat ccggccgagg gtcgataacc ttgtcgaagt ggcattcctc    2580
tttgagcaaa agctgctgtt gcgagcgata cgctccgaga agtcatcgct ctgctgatag    2640
gtgacacgaa aggcaatacg gttatggagt ccactccggc tatcgctgca gacatgtttc    2700
ggtctgtgtg cgcaggaggt ttacgtgtgc atcgaaaacg gtctgttcca catggacgtc    2760
gtagcatgct ggtggatctt ggccgtttcg ttctgtactg atcgccatac gagcccacga    2820
tctgagccca cagccagcga gcgcacggaa cttggctatc tccatgaagt agttggatcc    2880
tataccgaag tgaacttgat acgtgaagcg atttcctccn gcttgtagcc ggcatcggtc    2940
gcttgtccaa cagctctgcg ccccaagcca a                                   2971
```

(2) INFORMATION FOR SEQ ID NO:472

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 601 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...601

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:472

```
ctgccgtcga ctttagagga tccccggcag cgtcgcaaac tgccggaaag tcaaagtgac     60
ctctccccaa aaaccgagtt tcagccttgg gaaagttgaa tatcggttcg accgagcatg    120
caaaaagcaa agaacgatta cggcacatag tcagtgtttt gaaagaagac ttccatggct    180
ttgcgacagg ctcgatggtg cgcctgatct gaatacggta cttacctatg ccttcccggg    240
cgaatcgaat atccctggat taacttcaaa ccgggttata cccagcaaca gggtggggtg    300
gagccaatgt atggcaggcc ggtggtactg tttgcctcaa tgcgatggag agaatttctc    360
tcacctgaat acgcctatgc tcaacgtttc cgctatcaga acattgccat cgttcgcttc    420
gatggagtat ctgattctct ctctcctgct tgattcggga aatcagaaca ttgccatcgt    480
tcgcttcgat cccgtacggc ggaaggaatg gccaatcaga ttatgataga agcggccgaa    540
cgttcaatat gaagtcctac atgggaatct gctcgtgctt ttcctttact tccggttact    600
c                                                                    601
```

(2) INFORMATION FOR SEQ ID NO:473

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 970 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...970

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:473

```
cgggtcacca accagcgcga acgattgctt tcgggcgaga actttcccac ttcatatact      60
cttgctgcac cagtaccatg accatacaaa tggcaaagcc gtaccgataa tgccgataac     120
gctgagcacc ggattctgcc ggatgattgc cacgattgtc tgatatatct tttcattgtt     180
tctgtctctt gtgcggtatt tcgatggatg cggaaggcgt ccgaatggga aggggagaac     240
ctctgcccga gcctccggca ccatctttgc gatatgcttt ttctatcctt ttggagggcc     300
gaatcaaact atatactttg gtctgactaa actatatagt ttgtctgacc gaactatata     360
ctttggttga accaaactat atactttggt ttgtcaaact atatagtttg gtttagcccc     420
cttttgaggt cgattcgggc actctcaaga ctggtcatta aaccctgta ttttcaattga      480
ttaacctacc gatgcccgtc gaacattcgg atggtccggc tcgtctcccg ggcttgcaat     540
cgttgtgagt gaccatgacg atggtacgtt ccgtcctctg tattgagcga tgaaggatac     600
tcattacttc cgcccccatt ttggaatcga ggttaccgta ggttcgtctg cgaggataat     660
ctcgggattg cctacaatgg cgcgggaatg gccacgcgtt ggcattgacc tccggagagc     720
tgttgggggat aatgggcagc cgatgcgtca tttccatgcg ctcgaggact tcgtacgccg     780
ccttctcctt ttactttcgc tcatgcggcg atagaggagc ggcagcatgg cgtgtccagc     840
acgttgagcg tattgacgag atgaaaactc tgaaatacga atccagcttt tcattgcgga     900
aagcggccaa agccttgtcg ttcatggagt gaccgtttgt ccgaggattt gcaccgtccc     960
cgtggtagga                                                            970
```

(2) INFORMATION FOR SEQ ID NO:474

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 764 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...764

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:474

```
ttctataaaa ccaagccacc tttcatagaa tatagcaagg tctggctctt atgatcagaa      60
```

```
ctagaaatga ctttatctga tgctatatat tgggtaaatt aaatctttca tcaagtaacc    120
atagattatg atcctcatat ccgatttcct atcatcctta atcataggaa atattaggtt    180
atgcatttca ctttcttatg tgattttcca ccatctattc ttttacgcaa atcatcaaac    240
aattcattat tctacgtctc tggcaaacat aatgagccaa atcattctta gctgttctgt    300
tacatttttc aagatttttat ttgcttcatc ttctagtgcg ctacgcaact ttcgtctccc    360
gatgagtatt tatcttgcaa ttcctttaat gcatccttgc attttgctct ttgtcaaact    420
ttattttttg gaagcgcatt tcaaatcaaa ttctgaaact cctattggaa tagattccat    480
atctacgtct ttaacaaagt cttattccaa ggtgctgtag tatatacata atgttcgact    540
tttgcttctt atcattatat cggttttcta tgtcttcgga aaaatacgtt taatggatta    600
atgaagttgt tttcattatt ggttctcaga taaatcaaat aaaatgtcat cttctttttc    660
caaaaatgga aacccatctt ctttctgtgg tacnattttc atctagatat ttacccttgg    720
aacataccgc ttttatcatg gtagtccttc tggagttcca tggt                    764
```

(2) INFORMATION FOR SEQ ID NO:475

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 598 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...598

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:475

```
caattctttg atagctaaca atgcgttcaa atcatagaaa tggcggattt agacgataag     60
gatgccaacg gatcctcgct tatagagaat cgaatgagga aacagttttc tcgcacaagg    120
tttgtctaag ggacaacaca ttcaactaaa aggttcaagg tggtattgag tcaccacatc    180
ctccatattt cgcttttcag gtatgtggtt acaaatggct ctatcattct tttttcataa    240
ggaaaggatt ggcaaatgcg ctgatttcca caacaattct cgaaggaata ggattacaga    300
cacatctaaa cccacctgag catcatagga gaaggcttgc ttctatattt tgagcctttg    360
gatatatctg aaaaggattt atcctccgtc aactggctgt tacctctttc atcaagttgg    420
ataaaagcat cttaacttga tgccactcat attctcactg atgacagcaa agtccacatc    480
ctcagaaaac gatcaatcaa tagataagcc ttggataagg acgttccgcc cttaaataca    540
tttgctgact ataagagctc ttggataatg cacgaagtat ttctgagaat aatagtct     598
```

(2) INFORMATION FOR SEQ ID NO:476

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 445 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
```

(B) LOCATION 1...445

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:476

```
gcgtagcccg agtcgctgta gggcgtagct cgaccccct tcggcatatt tccgaacggc      60
tataaaacaa tgcggattca atccaggaaa aatatgcata tgctgtttat cagcatattt     120
catttctcag ttgaaagatt tcagcttgag aggcttcgac atccgatgag acttcaaact     180
ttttcccttt catttttgat cggttatagt caatgcccca acaagagctt gatcgataag     240
gcggccttat gagaatcggc accgtatcgc ttacatcgaa cacacgtaga tttacgagga     300
taaatccgtc aaattcttcg aaaggtattg gtcggaaaat aatgttttga tggattctgt     360
tcttaaacga cattgacagg gtgaccggaa ataaagcccg aagattctcc ttgatcgtcc     420
cgagaaaggc gcaagcgccg cgcaa                                           445
```

(2) INFORMATION FOR SEQ ID NO:477

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 6819 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...6819

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:477

```
cgagacggag agagactttc gaagaagttg ctgcagttcg tgcgtgacac cggttcgatc      60
ggttgggagc attcacctat tcgcacgaga gcggcaccac tgcgacaaga actatcaaga     120
cgatataccc gaatccgtca aacaggacgt cttggcgaac tgatggccgt gcaggaacgt     180
atatccgccg ctcatacgag gcgaagatcg gcagccgcct gcatgtggtc atagaccgtg     240
cggaaatggc ttctatgtgg ggcgtacgga atacgactct cctgaggtcg atccgaggta     300
ctgatcccgt tcgtctccgg tcaggagttg aatcccgggc ggtttatatg gcggaagtga     360
ccggtgcaga gcctttcgat ctctatgcac gttagtggac tgataacacc cttcctaccg     420
aaaccaaaag cagaaccgga tatacaacag gaactttgga ttgcacagtt ggctacggct     480
tcaggtgtcg tgtatcgacc tcgaacgaac tatggtctca ttactgtcgt ttgatgggga     540
gttcctcacc aaaggagacg ctgtacggca agatggtatc ggcttgtgca ggctgtaaaa     600
gcggatgaat atgtaggaat ccgtccggac ggctcactgt gctggtaccg ccgaggatag     660
aactccggct gacgtcttcg ggtgcccggc catccgagag acgatccctc atgctcttat     720
agacttggtg ccttaacgga ggaagtcgtg atgcgctggt ggaaggctat ccccgaactg     780
ctttggagct tctccgaaga ggacaccccg tatcctggtc gcagttcgga cgctcgagcc     840
ggtgaaagaa ggcgatgctc tgacaggata ccgcttcatc gcgaaggaga gttgtcggag     900
ttgctcaaca gacctttctc catgttcccc cagtcgattt gttgccgacc ggagagatac     960
ccgataccat tacccaaccg ttgtcgaaga aggggtttcg ttcgtttcat tgcacgaaga    1020
gagccaagag aagtcgcaga gcctcaagag atccccgtcc cagccgaaag cgataccgta    1080
catcggtaca gacggaagat gatatacttc ctacacctgc cgaggagaag ccttgacgga    1140
ggagccgctt cccgatacgg aggaggtatc acagccgcag cggaggagcc tttcgtcccg    1200
atcgaagagc cggcagagaa gaaagaagga agcgaaagag agcgaggacg accgctattg    1260
tcttcttagc agtctgatac tgggtgctac tgcggcatac ttgctactgt atcggatgcc    1320
tgtctctcga caaaagagcc ggcccgacaa gaacctttcg gccggatgtc ttacccgtgg    1380
atacgatcgn caagacggtc gatacggtaa agaccgtacc tccgcgacgg atctcggccg    1440
gatcgttatc cgcaaggggg acattttagc cgtatcgcct ggagaagta tggcgaccgc     1500
gtattctggg tctatatatt gaagagaaca aagagaaaat cgcagatccc aacaacattc    1560
cttttgggtcg gagctggtac ttcctttacc tgagaagtat gggatagatg cggccgaacg    1620
gcttcgttga gaagagcttt ggctcttcag ttccgaatag gaatgggaaa gaacggcagt    1680
agcgttgggg ttttttctaat tttgtggcca tgagcccaat atagatgtac aacagatcaa    1740
acagcgtttc ggcatcatcg gtagagtccg ctgatggaac atgtcatacg agtggcagca    1800
caggtggctc ctacgacatg tccgtcctcg tgacggggga gagcggttcg gggaaagagt    1860
```

```
tctcccacag ataatccact actacagcgc ccggaaacat catagctaca tgcagtcaat   1920
tgcggagcca tccccgaagg aaccatcgat tccgagctgt cggacaccgc aaaggttcct   1980
ttaccggagc cgtatcggat cgcaaggggg cttcgaagaa gcatccggcg gcacgatctt   2040
tctggacgaa gtgggcgact gcctttgccc acgcaggcga ggctgctgag ggtgctggag   2100
acgggcggtt catccccgta ggagccagcc agtcgcagaa gacggatgtc cgtatctagc   2160
ggcgacgaat gtgaacctca aggaggcggt agcgaacggg aagttcggag agacctcttc   2220
ttccggctca atacggtacc gatcgaggtg cctggctgcg tatcgagacg gacgacgtgc   2280
ccttgctttt tcgccgattc gccccgacag cgccgagaag tatccggatg ctccgctgcg   2340
cctatcggac gagcccgtac catattaatg cgttaccgct ggcccggcaa tgtgcgagag   2400
cgcgcaatat aaccgacagg ctgagcatcc tggaggagga gcggacggta cggcagagac   2460
catcactcgc tacctggacg ctgaggggat gcaagacctc accccgtcgt gatccgacgg   2520
aacgaaacga ccgaagcgga caaacaaacc cccattacga gcgcgaaatc atctaccagg   2580
tgctatacga tatgaagaag agatagccga tttgaagggg atgatgaacc gcctggcgca   2640
ccacgacagc cctcatggcc tgtagggtcg dacgtctggg gcaacgacga caagccaccg   2700
cagatccgaa gtggggcgtc agcacgcaca aggcccccat cgcgacgcgg cagaacccgt   2760
ggagccgata caggaagcca gcgaatacac cgagatccgg tttcgctgga ggaggtagag   2820
aagaaaatga tttcccttgc atggaacgcc acggcggaag gcgcaagcag acagccgagg   2880
aactgaagat tcggagcgga cactataccg taaaatcaag gagtatggac tggaatagaa   2940
cctcgggcga tacagccttt ccgctcttgc ggcggtgctt atcgtcctgt gacctgctcg   3000
gcatgcagca tctcctacag cttcaacgga ggtgctctga ctatagccgc atcaaaacgc   3060
tttatatgcc ggatgtgacc aatcaggcac ccgcgtatat cccccgttgg cgcagactat   3120
gaccgaagcc ctccaaacca ttttacgcgc cgtaccaagc tcgaaatggc acgaaccaac   3180
gatgcgacat gatcatcgag gtggtcatca ctaattacga cttcgctccc ctcgcgtaca   3240
ggacaacgat ctggccgcac gcaccaaggt aaccttatcc ataaggtgca ctacgagaac   3300
aaggcctccc gaacagaact tcgatcggga cttacgtctt ccacggactt cgacagcagc   3360
gagcagctgg tggacgtaca aacgccctgc tggccaatat ggtcgacgac ttggtgaagc   3420
aggtgtataa gctacggtag agaactggta atcctccccc accatgacga ctaacgatcg   3480
tacgcctaca tggagcaccc ctcgcggctt tcggctgaca cgctgcccag atgaaagccc   3540
tgtacgaggc ctatccctac tgctccacct tcgtcttcta tacctatata atatgtatgt   3600
ggtgcaggac gtgcgctatg cttcgggctg cgccggctgg caccctatct gccggacagg   3660
cgcaagctgt acctgtcgtg gagcaatata cgcatccgga gcagctgcaa cccgcctcgg   3720
ccgaaaggag ccggacgcct tctcgctcat cgatgacttc ctcgacgaaa tgaccgaagc   3780
ggagccgacc tgccttcgga gatttcttac ggaggagcga gcgtatcccc tcggcttcgg   3840
actacttcgc cgccacgtca ccggccgatc agccgaaccg tcccgcagca tgccggtctt   3900
gtccgtgcag gcagccggca accggccgag agcgcacctc cggcagcgaa agatccggcc   3960
ccgatcgccc ggcggacgag ctggacgaag ggctcttcac cgagaccctc gcacgtatta   4020
catcaagcag ggacgttacg ataaggcact gaggataata aagaccacag tttgaattat   4080
ccggaaaaaa acctttactt tgcggatcaa attcgatctt agaaagttg attattaacg   4140
acaaaaacaa aatataaaga tgtactcgta ctgactattc tcatcctgct catatcgctc   4200
ttccttattc tggtgtagtg gtacagaact ccaaaggggg cggcttggca gccggcttcg   4260
catcagcaat cagatcatgg gcgtccgcaa gactaccgat ttcctcgaga agccacttgg   4320
tggtcggccg gtatcattgc cgttctggcc atcgtttcta ccacttcctc cacacgggaa   4380
aggtcgatga gagccaaaac gtcctgaagg aaccctggac aagaaggtga aggaagaaaa   4440
gaactctgca gtgatcaact cggtggagat gccgctgcta cggaatctgc ccggcccgcg   4500
accggagagc cactcccgag gagggggcagg cacaataagg aggaccggcc ccttccaatc   4560
ccttgcagga gatacgggga tcgacagacg tctttgtctt tgagccaggc ttgagggcaa   4620
agacgttttg tttggcaggg tgccgctcgc cgcacccccg ggacaaggct caaggggcgg   4680
aacggacaga gcctccgagg gggtcgacaa gcccttgcga acggaacgga cggacgtacc   4740
cgaaaaaacg tctgacgttc cgacaaaaac gtctagacgt tttgactgaa acgtctagac   4800
gttcgaagca aacgtctaga cgttttcgc gaaaggtcta gacgttttga cgacccgacc   4860
ttttggcaga agacaagaga gatgacaaag agactattcc gcccgaatgg gcaccgcaag   4920
aggccgtaca attgacctgg cctcacgacg aaccgactgg gcttatatgc tcgacgaggt   4980
ggaaacctgc ttcgtccgat agccaccgcc atactccgcc acgagcgact gatagtcgtt   5040
tgccccgtcg caagcgggtg ttcggcctgc tgcctcccga gctgcaccac cggctcactg   5100
cttcgagctg ccctcgaacg atacatgggc gcgcgaccac ggaggatttc cctcctcgcc   5160
gacggccgtc cgatgatagc cgacttcgcc ttcacggctg gggcatgaag tttgccgccc   5220
atcacgacaa cctcatcacg agaggctcca cgccctgggc ctgttcgccg aaggagttac   5280
cctggacaat cgctcgcctt cgtcctcgaa ggaggagcac tggagacgga tggcgaaggt   5340
atttgctgac cacggacagc tgcctcttcg agcgcgaaccg caatgccggc tgagccggcac   5400
ggccattatc gacacgctga aagagagcct cggcgtcagc gcgtactctc cctccgccac   5460
ggagccttgg ccggcgacga caccgacgac acatcgacac gttggcgcgg ttcgtcgaca   5520
cccgtaccat cgtctattcc gctcggaaga tccctcggac gagcactact ccgacctcac   5580
ggccatgagc aggagctgaa ggagctgcgc cgcccggacg dacagccgta ccggccgtgc   5640
cgctgcccat ggcggaagct ctgtacgacg gagcggacag gctgccgcca cctatgccaa   5700
cttcctcatc atcaacgggg cagtactcgt gccacctacg attcgcacct cgatgccgtc   5760
gccctctcgg tgatgcaggg gcgtttcccg atagagaggt catcggcatc gactgccgtc   5820
cgctcgtcaa gagcatggca gtctccactg cgtcacgatg caagtacccc aaggattcat   5880
cgctaattcc acagcaaaga actatgaaag tagcactcat tcagcaagca acacggcgga   5940
```

```
cgtctgctcg aaccgggagc ggctggcagc gaagatcccg aagccgcccg acgcggtgcc    6000
gagctggtcg tactcccgga actgcacacg ggctttattt ctgccagacg gaagacgtgc    6060
aggtgttcga ccgggcgaga ccatcccggg accgagtacc gatttcttcg gcaccatcgc    6120
ccgcgagccg gcgtcgtgct ggtgctctcc ctcttcgaga agcgcgctcc cgggtttacc    6180
acaatacggc cgtcgtgctg gagcgggacg gcactatcgc aggaagtatc gcaagatgca    6240
catccccgat gaccctgcct attacgaaaa gtctatttca cacccggcga cttgggcttt    6300
accccatcc cgacgtccgt cgatgcctcg gcgtactggt ttgctgggat cagtggtatc    6360
ccgaagcggc cgactgatgg ccatgcaggg tgccgatata ctcatttacc ccacggccac    6420
ggtaccgaga gtacggacct gcctgccgag cagctccgcc aacgtcagcg tggcagatcg    6480
tacagcgcgg acatgccgtg gccaacggta ttcccgtgtg gcggtgaaca gggtcggcca    6540
cgaggcagac ccttcaggcc gcaccgtggc atcacgttct ggggctccgg attcgtagcc    6600
ggaccgcagg gcgaatgctg gccgagctga gcgcaacgga agaggcggtg gaggtagtgg    6660
atatgatccc tcccgaaccg agcaggtgcg ccgctggtgg ccgtcttccg ggacggcgga    6720
tcgacgcttt ctccggcctt acggancgtt tccttcgcgg ctaccatcat ggcgagaggg    6780
gggatggcgt tccgtccctt ccccctccga caggagccg                          6819
```

(2) INFORMATION FOR SEQ ID NO:478

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 724 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...724

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:478

```
ggtgccttga tttccgtttc ggcaacgccg ccatgcaatt tgagcgcgcc agcgtggcca     60
cgaggacggt aagcttgggt gcgacaccca tttcccgaat ttgatgtcaa ggaattttc    120
tgcacccaga tctgcaccga aaccggctcg gtgacggcat attcgccgaa agagagagcc    180
atctttgtgg ccaagaggag ttacagccat gtgcgatatt ggcaaagggg cctccatgta    240
caaatccgga gtgtgctctg tggtctgtac cagattaggc tttatggcat ctttagcaag    300
acggcaatgg atcctgctat gccgaggtct ttgaccgtaa aggagcacct tctttggtat    360
agccgagaag aatattttca agacggctgc ggggtcttca aagtctttgg ccagacagag    420
gatagccatg atctcggaag cggcgtaatg tcaaaaccgg tctggcgagg tattccgtcc    480
gagatggtac caaccccgta acggcattgc gcaaagagcg gtcgttaacg tccagtacag    540
cttccaaagt atttcggaga ggccgtcgca agtattgcgg ttctgataat atagttctcc    600
aaaagagccg taatcatgtt gtgagccgaa atgacagatg gaaatcaccg gtgaagtgga    660
ggttgatgtt ctccatgggc agtaccgtgc atagccacct tcggcagccc ccctttcata    720
ccga                                                               724
```

(2) INFORMATION FOR SEQ ID NO:479

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 390 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

        (vi) ORIGINAL SOURCE:
             (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

        (ix) FEATURE:
             (A) NAME/KEY: misc_feature
             (B) LOCATION 1...390

        (xi) SEQUENCE DESCRIPTION: SEQ ID NO:479

```
gcatccaaaa taatttttaat caaaagtaaa agatgaaatg cttctttatg ccctgattgg      60
gctgttgttc agtctgaata catatgctca gcttccggcg ttagtttgaa aaatatcgaa     120
ggaaaaacgg tacagaccaa caagttgaga atgccggaaa gccgatgatc atcagctttt     180
ttgctacgaa ctgcaaccct gtttgcgcga gctgaaagcc attcaggagg tatatgcaga     240
ttggcggacg agacgggcgt aaggcttata gctgtatcta tcgatgaggg gcaaatgcac     300
agaaggtgaa acctctggct gacggcaacg gctgggaata cgagtgctgc tcgacagcaa     360
cggtgatttc aaacgtgcca tgaacgtgac                                      390
```

  (2) INFORMATION FOR SEQ ID NO:480

        (i) SEQUENCE CHARACTERISTICS:
             (A) LENGTH: 882 base pairs
             (B) TYPE: nucleic acid
             (C) STRANDEDNESS: double
             (D) TOPOLOGY: circular

        (ii) MOLECULE TYPE: DNA (genomic)

       (iii) HYPOTHETICAL: NO

        (iv) ANTI-SENSE: UNKNOWN

        (vi) ORIGINAL SOURCE:
             (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

        (ix) FEATURE:
             (A) NAME/KEY: misc_feature
             (B) LOCATION 1...882

        (xi) SEQUENCE DESCRIPTION: SEQ ID NO:480

```
gcggacattt gcttctggct gcggtggata cggctttta tttggtacag agcgcaaaca      60
ggccgatcgt actccgatca atgaccgctt gcacaggcca ataccgaatt ggaggctttt     120
ctaagtcgct attagtcggg agagaggcta ctatcgtttt ttcttctcat tcctttcatc     180
ctttgtttct ttcctttctt cgaggtcttt gccgtgatcg gccttggaca cgtgtgttgt     240
aatacgctac ttactaattt caaagaatac aaacagaaat gggaatagga acactttatt     300
atttactttt ttggggcttg tagccggtgc cactgccgta tggtgatcac gcggacactg     360
ctcaagcaaa ggacagaggg gattctcgcc gagctcgccg tgaagccgag gtaatcaagc     420
agaagaagct cctcgaagtg aagagaaatt tctccaactg aaaggcgacc tggaaaagca     480
ggtggcacag gcaatagcaa gctccaatcg gtggagagca aactcaaaag ccgcgaacaa     540
ccctcaacca acgtcaggaa gatataacga agaaggggca ggaaatggtt tgatgccgtg     600
agaatctgac tgctcaactc tctgtgattg aaaagaaaag acggaactcg acgagctgaa     660
aactcgcgaa caggctcatc tggagttctg agcggactct ccgctgccga ggctaaagac     720
agactggtgg aaagctcaaa gatgaagcca aaggacaagc ctctgcatac gtcaatgaga     780
ttatgaagag gccaagatga ctgccaacaa agaggccaag cgaatcgtca tccatccatc     840
cagcgcgtgg ctacggaaac ggctatcgaa aactccgtga cc                       882
```

  (2) INFORMATION FOR SEQ ID NO:481

        (i) SEQUENCE CHARACTERISTICS:
             (A) LENGTH: 489 base pairs
             (B) TYPE: nucleic acid
             (C) STRANDEDNESS: double
             (D) TOPOLOGY: circular

        (ii) MOLECULE TYPE: DNA (genomic)

(iii) HYPOTHETICAL: NO

(iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
     (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
     (A) NAME/KEY: misc_feature
     (B) LOCATION 1...489

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:481

```
ggcttcaagt cgcgatcaga catgatggct ccttcgagtg caaatgccca tcgaagattt      60
tgatgcggca gcgatcatat tcgcccaaca aagtcttgct tcatccaacg tagctttgtg     120
ctcgggaaag tgggacataa gtccgggacc cttcgatcgt accggtagcg tatgtacttg     180
gaccaatcct tacgctgctc ttgatttcga tcgttgccgg cacaagagaa agagaattat     240
caccccttca ccctctttct ccaagacctt agcatggaca gccagcgaga attgttctcc     300
tcatccaata tgctgctatg tttttcaagt ccgggcagaa tatctcttct ctatcgggtc     360
atcatcttgt ntgatggcca tcagcatagc cgtcgtcttc ttgcacgagg cggagcataa     420
nttccacggt tcattgcggc tcggtgaaag ctccgttgga tgtcggcagc caagtcagga     480
gggacaggc                                                            489
```

(2) INFORMATION FOR SEQ ID NO:482

       (i) SEQUENCE CHARACTERISTICS:
           (A) LENGTH: 350 base pairs
           (B) TYPE: nucleic acid
           (C) STRANDEDNESS: double
           (D) TOPOLOGY: circular

      (ii) MOLECULE TYPE: DNA (genomic)

     (iii) HYPOTHETICAL: NO

      (iv) ANTI-SENSE: UNKNOWN

      (vi) ORIGINAL SOURCE:
           (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

      (ix) FEATURE:
           (A) NAME/KEY: misc_feature
           (B) LOCATION 1...350

      (xi) SEQUENCE DESCRIPTION: SEQ ID NO:482

```
agtattctcc gcaggaacaa gtatttttag gggcatcctt gaaaaggtga agcaccgctt      60
atgtatggag atcgtgaggt atggggtatg gctcgtgcag cgaggatttc ttttttatac     120
ttcccgttac ggatgacctc actcccggct tttctataac cgtcttacaa acgaaccctg     180
ctttgtgtca gaccaagaat aactgagtat ttcaaattcg ctcaagaagg tgattacatt     240
gaagtgaagg aagctctgta ttcatggcga atcttttgta ctatcgtttt ttccgacaag     300
aattacctnc tataatgctc ccattgaagg tgttgcgagc aagcgggaaa                 350
```

(2) INFORMATION FOR SEQ ID NO:483

       (i) SEQUENCE CHARACTERISTICS:
           (A) LENGTH: 382 base pairs
           (B) TYPE: nucleic acid
           (C) STRANDEDNESS: double
           (D) TOPOLOGY: circular

      (ii) MOLECULE TYPE: DNA (genomic)

     (iii) HYPOTHETICAL: NO

(iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
 (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
 (A) NAME/KEY: misc_feature
 (B) LOCATION 1...382

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:483

```
ggaaaaattt ctgacgaatt tgagttggag tccggacgaa aatatcttga tgtagctgag      60
gtgaatcgtg ctcaaaacga atgtgaggta aatgcctaga cgctgagacc ggtagattcg     120
tccgtacgct ttttgttgaa accgataaca ttatgtagag ccgttacatc ccctgacatt     180
ccttccggga agtaacatca gttcatttgg cagagccgtc gcgacggatg gaaccatctc     240
tatcttatga tactacaggt cgtctgatcc gtcaggtgac aaaaggggag tggggggttac    300
aaactttgca ggcttcgatc ccaaggggaac acggctctat ttcaaagtac cgaagccagc   360
cctctcgaac gccattttta ct                                            382
```

(2) INFORMATION FOR SEQ ID NO:484

 (i) SEQUENCE CHARACTERISTICS:
  (A) LENGTH: 388 base pairs
  (B) TYPE: nucleic acid
  (C) STRANDEDNESS: double
  (D) TOPOLOGY: circular

 (ii) MOLECULE TYPE: DNA (genomic)

 (iii) HYPOTHETICAL: NO

 (iv) ANTI-SENSE: UNKNOWN

 (vi) ORIGINAL SOURCE:
  (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

 (ix) FEATURE:
  (A) NAME/KEY: misc_feature
  (B) LOCATION 1...388

 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:484

```
ttttccaaag agcggttcga atacaccgcc ggtggcatcg aagcatgccc atagaggata      60
gtatcttcgg tgtggaagta ttcggcaatg gctttctcaa ttctttgtgg atgtcttgcg     120
ttccgcaaat gaagcgtacg gagctcaccc gaatccacgc tcatccatcg catccttggc     180
agcctgtatc agccgaggtg atcggacaga ccgagatagt tgttggcaca aaagttcaat     240
acctctggcc ttcgtttacg cggatgtcag cacgctgggg ggtgatgatg atccttcttt     300
cttgtacaga ccggcttctt cgatactctt gagttcggca gccagtagtc tttcattcct     360
ttgtacatag cactggagtt ttttaggt                                       388
```

(2) INFORMATION FOR SEQ ID NO:485

 (i) SEQUENCE CHARACTERISTICS:
  (A) LENGTH: 651 base pairs
  (B) TYPE: nucleic acid
  (C) STRANDEDNESS: double
  (D) TOPOLOGY: circular

 (ii) MOLECULE TYPE: DNA (genomic)

 (iii) HYPOTHETICAL: NO

 (iv) ANTI-SENSE: UNKNOWN

 (vi) ORIGINAL SOURCE:
  (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

```
    (ix) FEATURE:
         (A) NAME/KEY: misc_feature
         (B) LOCATION 1...651

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:485

atggaatata tgatagcctc gatgctcttg aaggcatcgt cgtctatgtg atatccttga    60
tggcctttcc cactcccggg atcatggatg caagctcttg aggttaccca tctttttgat   120
ctgatgtatc tgggcaagga agtcattaag tcgaactgat tcttggctat tttctcctcc   180
agtttgcgag cttcccttcg tcgtattgct cctgagcacg ctccacaagc gatacgatgt   240
ccccctgcca aggatacggt cggccatacg ctcggggtga aaagcatcga ttgctccatc   300
ttctcccccg taccgacgaa cttgatgggc ttgtttacga ccgacggatc gagagggcgg   360
caccgccccg ggtatctcca tcgagcttgg taggacaaca ccgtcgaaat ccaagcgtgt   420
attgaactcc ttggctgtat tacggcgtcc tgaccggtca tcgagtccac cacgaaaagg   480
acttcgttcg ctggatggca gccttgatgg cctctatctc gcgcatcatt tcttcgtcgt   540
ggccaaacga cccgcggtgt cgatgatgac aacgtcgttc cccttggttt ggcttcggct   600
atggcgtgtc gggctattct cggaccggct ttttgctgcc cggttcgctg t            651


(2) INFORMATION FOR SEQ ID NO:486

    (i) SEQUENCE CHARACTERISTICS:
         (A) LENGTH: 2626 base pairs
         (B) TYPE: nucleic acid
         (C) STRANDEDNESS: double
         (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
         (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
         (A) NAME/KEY: misc_feature
         (B) LOCATION 1...2626

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:486

gtcaaacctt ccttgatctt cgtaccatca cgatacaccg tgtaggtata tcggtcgggg    60
tggggctgcc acccatggtg aactgaatat catccaaaga atgtagttca aatccgagca   120
attgtagtga cggaaagcaa catacttgtg cccgcaggca aatctaccgt acgctcgatc   180
catacacttt gaggttggcg ccattggctt ccgtggaaag accgaatctt gctccgccct   240
tatttttccg ttaggcgttt cttcgaaaac gaccgtgaag tctccggcgt cgtcccgtc    300
ttggagatca tcaccgcata gtgatccccg ggaaaaccgt cgtgactgca tagtagtact   360
ttaccttcgt tgcgcctgta acatcctttg agtgagatag ttatcaggat tcaaagccat   420
tccattccat gagaaagagg cactacgttg gtgccgccat gagctgtcag ccatcccaat   480
tgtccggaag cagacagagc caaccctgac catcgccatc ggcatcgata gtagtccatc   540
cgctggtgcc tctccatgag tagaagactc gaacgtttcc gtgaagtcgc gcgcttgccg   600
ttggccttga tctcaacatc atcgaggttg atccagagaa gtccgtacag ccgaagtgac   660
ggaaggcaac atacttagta cccgcagcaa ctgtaccgtc ttttgatacc aggtgccctg   720
aacacgagtg ccacgatggc ttccggtgcc gtaacaactg tcttggccgt cagcacttct   780
tccacaaagc gttggcgaag ttggaagcgt cgttacccgt agaagatgca taccggcata   840
gtgctctgat gcataattgg catcttgtgc acatacccag aagtaagcgt tcctccgtta   900
ggaagagaaa gctccggtgt aaccagatag tatcagggtt ctgagggcct tcaaagttga   960
tataagaagc cgaagagaca agatcgcact gttgtgacct gcaaaagagg agcctccggg  1020
aggaggggtg tcgtccaatt gttgccgtca ccgtctgcat cgatcgtctt ccatgaggag  1080
gaataccatt ttcgaaggat tcgttcagaa cttccgcacg cttagatccg gtgcattcca  1140
tttaaggatt gcatccatgc tgttaggagc ttgttcgccg tcaggttctg tacaggattg  1200
aactgtgtcg gattaatagt tacgttacgc actctttcgg agatacgcgg gctgtgtact  1260
tcacttccac gcaaactcat gattgcccgt agctacgccg tcttcttcga aggtcgtttc  1320
ggtaaacctt ccttgatctt cgtaccatca cgatacaccg tgtaggtata atggtcgggg  1380
tggggctgcc acccatggtg aactgaatat catccaaaag atgtagttca aatccgagca  1440·
attgtagtga cggaaagcaa catacttcgt cccgcaggca aatctaccgt acgctcgatc  1500
```

```
catacacttt gaggtttggg ccattggctt ccgtggaaag accgaatctt gctccgccct    1560
tatttattcg ttaggcgttt cttcgaaaac aaccgtgaag tctccggcgt tcgtgccgtc    1620
ttggagatca tcaccgcata gtgatccccg ggaaaaccgt cgttgatgca tagtagtact    1680
ttaccttcgt tgcgcctgta acatcctttg agatggatag ttatcaggat tcaaagccat    1740
tccattccat gagaaagagc ttacacgttg gtgccgccat gagctgtcag ccagtccaat    1800
tgtccggaag acaacagagc caaccctgac catcgccatc ggcatcgata gtagtccatt    1860
ccctggtgcc tctccatgag tagaagactc gaacgtttcc gtgaagtctg ccgcttgcca    1920
ttggccttga tctcaacctc atcaaggtcg atgtagaaca atccgtgctt tggaagtgac    1980
ggaaagcaac atatttcgta cctgcgggag gtctaccgtc ttctggcgcc aagtaccctg    2040
tatacgacca cgaatagctc cggcgagcga acaccttttg ccgtaatcgt ctcttccaac    2100
aaagcatcgt gaagttggat gcatcgttac cggtcgaaga tgcatacacc gcataggctc    2160
ggatgcataa ttagcatcct gtgcgcatac ccagaaagtc aacttcctcc gttaggcaaa    2220
tccaatgccg gtgttatcag atagttgtca ggggaagaac tcctatacca ccaagaccga    2280
atgactctga atatacacaa ccatgctatt gtagccagcg attccgggag catttccagg    2340
cttccagcca tgccgtcacc gtctgcatcg atcgtcttcc atgaggcagg aataccattt    2400
tgaatgattc ggaaagtgta gttgttccgg gattcggatt tggattcgga ttggatttgg    2460
attcggggta ccattaggtg catcccactt aagcgttact tctggccgac tgcactaccg    2520
gtcaggttct gtacaggagc aaattcatgg atccttctac cgtaacgtct ttacatacct    2580
tcggagatac gccggcttgt acttaacttc cacgcaatac tcatga              2626
```

(2) INFORMATION FOR SEQ ID NO:487

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 833 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...833

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:487

```
atataaatgt ttcgtccaaa cctaagaggg ctgcagtacg ggcacggttc gctgtagttg      60
ttcgtagcgg agattctgaa ccacagccag attgtgcttt ttttgaacaa acctatctcg     120
tatgccactt gcatccgccg agctagcatt ccactatact ctcatctatc tgatcaatct     180
gcatgcgcca agagatagct cttcgtcttg cttttcggat tggcgccgtg ggatacgcag     240
tcgccgagga tttgggcaag tacagtaggt gttatctgct ggcttgcatc gcttgagcct     300
tatccgggca gcaatgcgac tcgataatta gcccgtcgaa attatttcca tggcttgctg     360
gctgacggat tcgatccgat ctctctgtcc cgaatatgac tcggatcaca aaggatggtt     420
aacgaaggaa aacgtctttt caatcgaagg gaatctgcca atgtggagga ttgcgaaacg     480
tcttggtcgc taggtactga atcctctatg gatggctccg atctgtcgaa ctccggactc     540
cgaagccgtt ctagggctcc tgtccacaga tccaaatcgg gactgatcga ttcttgacga     600
ggacaatcac cgattcgtcc ttgcctatcg tatcggcatt tcttgtacag caaagggatt     660
ggatgtggtt cgtgcaccta accagatatt ctgataccgg cttgcatggc ttgctctacg     720
tgttcgcgag tagcccttcc gtggtagcaa gcatatccaa ttcatcctgt acacgcacca     780
accaggtagc cctgtttctn ctactncttc gaagcacccc ggcaaggtac gag           833
```

(2) INFORMATION FOR SEQ ID NO:488

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 2126 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

(ii) MOLECULE TYPE: DNA (genomic)

(iii) HYPOTHETICAL: NO

(iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
    (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...2126

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:488

```
tgccaaagcg atttcccatg gatttcggaa acgatcgcgg gattcgacga tttcgtgctt        60
ggaatagttc ggtggacagg aggcaaacca ccggtaattc accggctttt cccactgatc       120
gaggaatctt caccaaaatc tcgccaattt gactgtgtcg ccatcgtctt tcacaacgtg       180
ggcacccatc gggagatata gttcttgagc atctctccat tctcgtctat tattcgagca       240
tagggggccat cgtcttatcc ttggattcga tgataatctt ttctttcaga ccggcgtctc       300
gtcgctttcc atcttgaaag ttacattctc cactacacct tcgaagagag tgttcctgct       360
acttccgata cgatgaccgc attgaacgga tccattcgat gattttgtca cctttcttga       420
ctgcatcacc ttggcggaag acaattttgc accgtagggg atattgtgat tggccaaaat       480
gataccggta tcggatcggc aatacgcaat tcagtcatcc gactcactac gacctgatgg       540
attcgtctgt tacatccaca gcacgtagtt cctcgaattc caagatacat catatttgga       600
gagcaagcta ttctccgttg ccacattgga tgcgatactc cgacgtggaa tgttcggaga       660
gtaagctgtg tacccggctc tccaatgact gagctgcaat aacgcctacg acctcacccc       720
gttgtaccat gcggtggtag caagatttct accatagcac ttggcacata ctcctttctt       780
ggatcgcagg tgagaacaga acggatttca acagcttcga taggtgaatc ttcataatct       840
gtgctgcctg ctctctgatc tcttctccag ctctaacgat taatcccctg tagtaggatg       900
gataatatcg tgaacagaga cgcgcccaag gtacgttcgt acaaggaagc aacgacatct       960
tcgttttgct ttagctcggt gtaagcagtc cgcgtagcgt gccacaatct tcctctgtga      1020
taataacatg tgagaaacgt ccacaagacg acgggtgaga taaccagcat ctgccgtttc      1080
aatgcggtat cggcaagccc cttacgtgca ccatgagtag aaataaatat tcaagtaccg      1140
agagtccttc cttgaagttt gaaagaatgg ggttttaata atctgacctc cttcggctcc      1200
actcttttgg ggcttggcca tcaatcacgc atacctgaca actgacgaat ctgttccttg      1260
gaaccacgtg ctccgaatcc atcatcatga agacagagtt gaatccgtca ttgtctgaac      1320
tgattgcttg atcagaacat ttgacaaacg gccattgata tgtgtccatg tgcgataatc      1380
tgattgtatc gttcattaaa ggtgatgaat cccatactgt atcttgcata atctgctcga      1440
cggcagtgta accttcttgg atcaattggt tttctcatca ggataagca catctgccaa      1500
gttgaaagac aagccaccct aaaagccatg tagtaaccca aattcttgat atcatccaag      1560
aatttggcgt tgtagctact ccgcagatct tgattacgct accgataata tctcgtaagc      1620
tttttttcccg agtacttcat tgacatagcc taccttcttc ggtacaattc gtttaccatc      1680
agtcgcccta cggatgtctc taccatacga cgaacagttc tccgttctcg taatcctcta      1740
catagacctt aatcggcgca tgaaatcgac tttaccctcg ttataggcta ttgtcgcttc      1800
ttcagggcca tagaaatcag gccgtgccct ttggtattgg gacgtagctt ggtaatataa      1860
taagtcccaa taccatatcc tgtgaaggaa cggtaatcgg tgctccattg gagggttaag      1920
aatgttatgt gaagccaaca taagcaattg cgcctcaaga tagcttcgtt gctcagagga      1980
aggtgtacag ccatttggtc tccatcgaat ccgcattaaa tgcagtacaa ctcaatggat      2040
gcaactgtat tgcttttctt ctatcagttt gggttggaat gcttgaatac ctagtcggtg      2100
aagagtcgtg cacggttcag aaggac                                          2126
```

(2) INFORMATION FOR SEQ ID NO:489

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 940 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:

(A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
(A) NAME/KEY: misc_feature
(B) LOCATION 1...940

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:489

```
acagcagttt atgatcagcc ggaagctgca tgcttcgccc ttttctccgc cctcttccgt      60
ctgttggctc tcttcgccct ccttttttggt gccaatgctt gatacctcat gtcgattctc     120
cctggctcga tatacccctt cgttccaccc catcggagta ggggcacttg tggcagtcta     180
tgccatgcgc ctgtctccga gttcaataga gccatagaca aatatctccg tcgccgatga     240
gcctatacgt cgattctctt ctcgccttta tgccctccgc tcccaaacgg atgcgtatat     300
catcacagag ggaaaacgac gcctgcgccg cctaacggta gagctcggct catttgcgaa     360
gcacagcagc gcaacgatga gctaaaaaag aactatgcgg caaggaaacc atcaatgtcg     420
tattccttgc cgtgtacgat tcatgtggaa atacgatgcc ctgtttgctg ccatgctccg     480
gcatccgcgt ttcggcctgt actcatcgtt tgncctgcgg gacaatctgc cggccggcga     540
cggggcgaac tcctgcaaaa gacgcttgct cactttcagg ccaaaggctc gatccgcaac     600
cggcttgtcg ggacaatgga gaggtgagag acattcggct gaatttgcac cggattacat     660
tttctatacc acaccttacg acatccgttg cctccgcccc ttcgccagag gacctttccc     720
gatatactca cctgcacagc ctctatggct atcccctcga agaatatcct gactggtacg     780
acctctgttt cacaatcttc tggggtacta cttttggttt cggaagaaga cctcgcatct     840
actcgcgact cttctcgcgt gaggggatgc aacggagtgg tcgcggagca cctttgtcga     900
tgctttctcc ttcgaaaatg aggagtcgac cgaaaaaaat     940
```

(2) INFORMATION FOR SEQ ID NO:490

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 1920 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: double
(D) TOPOLOGY: circular

(ii) MOLECULE TYPE: DNA (genomic)

(iii) HYPOTHETICAL: NO

(iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
(A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
(A) NAME/KEY: misc_feature
(B) LOCATION 1...1920

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:490

```
taccgtcttt tggaggaatt gcctaccgat ccttgggatc gcccgatggt ggagtcatca      60
ccgaaagcga aacactcttt ctgctgaccg ttttttcctt tctgttgcct tcgtatgtag     120
cccgaaaggg cgaatgtatc ggtgaaaagt tctctcgggg gattcctccg ccggttgttc     180
ggggtggagc caaatctgtt gtggtctgtc ttggtatagt cttccggtgg tagcttgtcg     240
gttgttgaaa agccctactt ttgtaagaaa ccaataaata tatacacaat gaagttgaag     300
tagccagcaa cgtcctgttg caacacttgc aattgattgc ccggtcatag cttcacgcag     360
tacacttcca attttggagt ctgtactttt cggcttgagg gagatcaatt acgtcttacc     420
gctgccgata tggccaatcg gtgagtacgg aacttaccgt gaacaacgta ggggcgaaa     480
acggttcttt gccgttcccg agaggatctt acttgaacca ctgaaagaat tgcccgatcg     540
ccgatctctt ttgagataaa tatggaaacc aaagccgctg aaatagcaac agcaacgggc     600
attacagttt tgtggtacag gatgtttcga cctatccgtg gcagcttctt tgtctcccga     660
agcaatcgtt tctatcgttc cggcggagcc ttgctcagtg gcctttcggc tacgctcttt     720
gctaccagtc aggacaacgc cggccgatca tgacaggggt ctatctggat ttcttcgagg     780
acaacttgtt ttcgtaggct cggatggaca gatcttggtg aagcaggagg atgtaatgtg     840
cagagccgtc ggcgtagtgc cttctgcctg cctaggaaag ccgtcttctg ctgcgcaatg     900
ttctgccccg actggaaggc gatgtgacac tacgtatgac agcaactatc tccatataga     960
acttggcaat tatacgctca agcacggttg ctggaaggtc gttatccgaa ttataatagt    1020
gtaatacctc cagcaatcct ttctcggtga aagtggatcg tgctcaactc ctatccgggc    1080
caagcgcgta tctatcttct ccaatccggc tacgagtatg ctgcgcagga gtttacccct    1140
```

```
gcaggcatcc gcttatcggc taatgatata gatttcctgt ggctgctgaa gaacatgtgc    1200
cggcagaatg tccggccgac atcaaatgcg catcggattc aagtcggatg tctttcagac    1260
aattctgcaa ggaagccatc ggaagaagtg ataatgactt tggctgatca gactcgtgcc    1320
ggttcatact gccggcagag aatgcaccgg ggataagcct gtgcaatttg ctttgccgat    1380
gaagttgatc ggcgaataaa aacgaattcg aatgaaattg atctgaaaaa cccgctgatc    1440
ttcttcgacc tcgaaacgac gggtgtggat tggtacggga cagaatcgtc gaaatctcca    1500
tactgaaagt catgcccgag gaagcgaaga gtgtaaaaca aggcgtatca atcccgaacg    1560
ccctattctc ccgaatcgac agccattcac ggcattaggg atgaggatgt gaaggacgtc    1620
cgccattccg ttcggtggcc aaaagtctgg cgcaatggat agaaggtgtg atttggcagg    1680
cttcaattcg acgcgattcg atgtgccgat gctggggagg agttcctccg tgcccggagt    1740
tggacatcga cctccgccac agaagctcat agacgttcag acgatttttc ataagatgga    1800
acctcgcaca ttgaggcagc tactcgtttc tattgnaata gaactttgga aaatgcgcat    1860
tcgctgaagc cgatacgccg tgctacatac gatgtgttca aggcccaatt gatcgttatg    1920
```

(2) INFORMATION FOR SEQ ID NO:491

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 543 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...543

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:491

```
gacttttgtt ggataatata aaatgacata cagaattatg aaagctaaac tttattatta     60
gcacttgcgg gtctcgcatg cacattcagt gcaacagcca agaagctact aracagaaca    120
aagcagggat gcacaccgca ttccaactga taaggcctcc gatcattggt tcattgacat    180
tgcaggtgga gcaggttggc tctctcggga tggaataatg atgtagactt tgtagatcgt    240
ctaagatcgt tcctactttc ggtatcggta aatggcatga gccttatttc ggtatcgtct    300
ccaattcaca ggattcgaca tctatggatt cccgcaaggg agcaggagcg taaccacaat    360
tactttggaa acgcccacct tgacttcatg ttgatctgac gaactatttc ggtgtatacc    420
gtcccaatcg tgtcttccat acatcccatg ggcaggtata ggatttggtt ataaattcca    480
tagcgaaaac ccaatggtga aaaagtagga agtaaagatg atatgaccgg aacagttaag    540
tcg                                                                  543
```

(2) INFORMATION FOR SEQ ID NO:492

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 887 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...887

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:492

```
ccctcattaa aatncaggta aacggtaact gtctaatact gagaaaatca aatccaatag    60
cctttctctc ttagcagana agttcatcag gtactttctt gcagaaatac agtttgcccg   120
actctccgaa aagggaaagt cgggcaattt atgaaaggac gaaaggtaat agccctgtaa   180
aagcctttat ccttcgcgtt cagcatttgg agtcgcttct ccagatcagg gaattggctt   240
tcgggaggag cgacgtacag atacgcatcg cttcgttgcg cttgctgcct gtcgttttag   300
cgtgatggca cacataccgt agcgcacaaa cttctcgatc aactgctgct atccatcccc   360
ttataaccga ctgtgaagta gaatccgtca gcagtggttc aatttgccgt ccttatcata   420
gacgatattg aagccgttgt caggaacatt ttcttcatga tccgagcctt ccggccatat   480
tcgattacag gtcgcggaag ttatattctc catcattgca ggctttgagc atggcagcct   540
accccattgt gcagagtgag tggctcccga agacagagca tacagagcga tgatgacaat   600
gcctcgccga aacgcagacg cccgaatgac tcttccagtc cggatactca cgctcgtaga   660
gcttgcccga tatcatgagt actccgtgcg ctgaccggca tagctgaatg ccttggagct   720
ggagagagcc agtattaatt gtccgtgtag ttggctacgg aaggttgata gagcggctca   780
cccgatggga atagtcctta cggaaatcca tgccgaagta tgccaagtct tcttgacgat   840
aacatcatgt ttggtcgcca gctcaccgat gatgcgcagt tctcgtc               887
```

(2) INFORMATION FOR SEQ ID NO:493

        (i) SEQUENCE CHARACTERISTICS:
            (A) LENGTH: 633 base pairs
            (B) TYPE: nucleic acid
            (C) STRANDEDNESS: double
            (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
         (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
         (A) NAME/KEY: misc_feature
         (B) LOCATION 1...633

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:493

```
gctcgtgcct cttcgagcgc gatccgcatg tagcggatgt catccgtgga aaggtagggg    60
ctgtcatcgc atttcctcct ctcgaaaaag caanggaggt cgctttctaa ccggtgtatc   120
acttctttca tcagcgtttc tcggatcaac gggagcggtt ctctactttg aagcggctgc   180
aataggtctc gacggcttgt gctccgcttc gttcagtcgg atctgaatgg ctttctttcg   240
gagcacgtgg ctcgcgggag tacattgtgc cgattttcc tgctcatatt cagtatgcaa   300
atatagtccc tttattctgt tgtcggccgg tctgcatcca ccatccacgg aaagtaagac   360
ggtgatgtgg cgaaactccg aaacgacgaa tacggatttg tgtgcaggtg acggataacc   420
tttgttgcgc tcccatccgt aatcgggaag tccttattca gacggagcat cgagtcgtcc   480
cgataggttt ggccaaaatg gaagctgctg cgatggagcg atagcgggca tcgcctcccc   540
gatacagtgg tgagggattt gttcgaaagg atcgaaccga ttgccgtcga tcagcaatct   600
ttcggggcga aaaggcaact gctctatggc gcg                              633
```

(2) INFORMATION FOR SEQ ID NO:494

        (i) SEQUENCE CHARACTERISTICS:
            (A) LENGTH: 5572 base pairs
            (B) TYPE: nucleic acid
            (C) STRANDEDNESS: double
            (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

(iii) HYPOTHETICAL: NO

(iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
     (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
     (A) NAME/KEY: misc_feature
     (B) LOCATION 1...5572

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:494

```
cgagcagaaa ggtaaggtaa tagactgtgt aaagacgggc tatacgctca cgacaaagtg    60
atacgtcacg ctcatggggt ggtgggagaa tgaatcccgt caacgaatcg gagcagaacg   120
aacaaggata agacatggca gaaaaaaaga ctattacgaa gtcctcggtg tatcgaagaa   180
tgccaccgac gatgaatgaa aaaagcatat cgcaagaagg ctatccaata ccatcctgat   240
aagaacccgg tgacaaggag gccgaagagc acttcaaaga ggtagctgaa gcctcgacgt   300
attgagcgat ccgcagaagc gcagtcaata tgaccagttc ggcatgccgg attgggcgga   360
gctgccggtg gaggtttcag cggaggcggt attccatgga ggatatttc agtcgcttcg    420
gtgatctatt cggtgggttc gcggttcggc ggattctccg atatggccgg tggcagtcgc   480
agacgtgttc cagagggtct gacctgcgag tacgagtgaa gctttctttg gccgatatag   540
taaaggtgtg gagaagaaag tgaaggtaaa aaagcaggta gtgtgcagaa atgtcgtggc   600
gatggcacgg aagaagccaa tggcaagact acctgccgac ctgccatgga accggcgtgg   660
ttacacgtgt gagcaacact ttccttgggc catgcagacc cagagcactt gtcccacttg   720
ccacggagag ggtgaatcat cacgaagcca tgctccaagt gtaagggcga aggtgtggag   780
atcgcgaaga ggtgatctca ttccacatcc ctgccggtgt agccgaagga atgaaatgtc   840
cgtgaacggc aagggaaatg ccgcgccccg aggaggcgtg aaggcgactt gatagtcgtg   900
atcgccgagg aaccggatcc gaatctgatc ccaatggcaa cgatctgata tacaatctgc   960
ttatatccgt tccgttggct taaaaggagg tagtgtggaa gtgccgacga tagacggacg  1020
agccaagatc gcatcgaggc ggggacacaa cccggcaaga tgctgcgttt gcgcaatagg  1080
ggttgcccag cgtaaacggc tatggcatgg gagaccaact ggtgaattca atgtctatat  1140
ccccgaatcg atcgatgcca aagatgagca ggctatgcag cgatggaaaa ctcggacagc  1200
ttcaaaccta ccgatgctgc tcgtaggata tagacaagaa atacagagag atgctggatt  1260
gaaagacaat gccatgtatg gtacttgacc tgagaaaagc tgccggtatc cggtatgcag  1320
tttacaaacg aagtcttttt gagcgatgaa caacgaattt ttgcagacag aaaggatatt  1380
gtccgtatgc tgcgtacagt atacgacccc gaaataccgg taatgtgtac gatctggggt  1440
tgatatacaa tgtggacgta ggagccgacg gttcgttacc gtcaccatga cactgacggc  1500
accgaattgt cctgcagcaa cttcatcata gaggatgttc gcatgaaggt ggaaagcgtg  1560
aaaggcgtaa gggggtaaag atagacctga ccttcgaacc cgaatggaat aaggacagat  1620
gagcgaagaa gccatgctgg agcttggatt cctctaaaaa cctcggtccg aatcgaattt  1680
ccccatgcgt tcgaagatct actttaccag cgatgccatc tcggttcgcg ccatcatgcc  1740
gatcctatga cagtggagag gcgttggccg cttggttgga gcgtattcgc catgaggcca  1800
aggccatcta cttatgggcg acatgttcga ctattggttc gagtatcggt atgtggtgcc  1860
tctggcttca cgcgtttcct cgggaaagta gccgaattga gcgatgaggg gtggagattc  1920
atttctttgc cggcaatcac gacgtatggc tgacagatta ttgaccaagg agctgggtgc  1980
tcatgtccat atgcatggca ttacggtggg ttgtccggca agctcttccg cttggcacat  2040
ggagatgagg agtatcggct gtgaagcgtt cgtacgactg catgtaccgc ctcttccgca  2100
atccgttgca cgcctccttt atgcagccgt gcatcctcgc tggacagtcg gtttggctat  2160
ggcatttcac tgaaaagcag acgcagcgga gagaagcgaa agacatcggc aatatccccc  2220
acgcctacag caacgactac ttcgatatag aaaagaatgg ctgattcgct ttgccaaaga  2280
gcatagtgcc cgacatcccg aagggatttc tatattttcg gccatcgaca tctgctggtc  2340
gatatggcat ggcgatgag aagcgtgtcc tgatccttgg cgattggatt cgttacaact  2400
ctatgccgtt tgggatggca cgacgcttgt gctcgaatcc atggaggaca ggaataagcc  2460
ttcggtacca agatcgggac agaccgcttg ataaaataca cttcacgccc gttcagggta  2520
taaacgaaaa tagctctatg ggaaagatac aatcacggta ggcgatatta ctcgcttcga  2580
aggagatgcc attgtcatgc ggcgaatcat accctttfgg gtggaggggg agtggacgga  2640
gccattaccg agcagccggc cccgaactgc ttggaggagt gtcgcactct caacgttgcc  2700
ctacgggaga aagcaaaata acgggaggat acaatctgcc ggcgaatacg ttattcatac  2760
cgtaggccct gtgtggcatg gagggcaaca tgggagccgg agctattggc ttcctgctac  2820
cgtacatcgc tgtccatagc ttggacaagg gactgaaatc cattgccttc cctgcatcag  2880
taccggcgtt tccgttatcc taaagatcag gccgcccgca ttgctttggc cactatcggg  2940
agattattgc agatcgcccc attgacgtca ctatcgtgtg cttctcggag cggataagga  3000
gttttatatc acacaggact gacgcgtaac tccttggctt ctcgcaagat ctctatcgaa  3060
aagccttgca gtatactccg ccttctttct cttctctatt cagttcgctc tcaccccccc  3120
aagggttccc ttccaaaccc cttagggatc cccctgaga cccotaaggg gtcctacccg  3180
agactcttag gggtcccata ggagactcct cggggtctc aacagggact cctagggatc  3240
```

```
gtccccatac ttcttgatgt cttcggagaa ggttttccaa agaactttc ccctcctcct    3300
ctctgcacgc ttgccctgaa tctgtgctgt cacgtcacgt tttttttac atttgtgcct    3360
aataagctaa ctctcgaggc tatgggaaaa ttgttacagg ataaattggc tcagtatacc    3420
gagccgcaaa ggcacaagcc gcaggtattt acccttattt cagaaaaatc gaaagtgata    3480
ggataccgag gtcgttatcg atggtcggaa agtcctcatg ttcggctcaa tgcatatctg    3540
ggactgacga accacccgaa agtcaaggag gcagctacga agcgacaaag aagtacggta    3600
cgggctgtgc cggctcccgc ttcctcacgg cacactcgat attcacctcg aactggaaaa    3660
acggctggcc gagttgtcgg caaggaagat gccatcagct tctctaccgg cttccaagtg    3720
aatcgggcgt tgtctcctga atcaccggcc gcgaggatta tatcatctgg gacagttgga    3780
tcatgcttcg atcatcgagg gtattcgcct ttcattcagc acaagttaaa gtacaagcat    3840
aatgatatgg gttctctgga gaagcggctc cgcagtgcga cccggagaag atcaaactga    3900
ttgtggtcga tggtgtcttc gtatggaggg tgatgtctgc aatctgcccg aaatcgttcg    3960
cctcgccaac gatacaacgc caatgtgatg gtggacgaag ctcacggtat cggcgtgagg    4020
gcgaccacgg acgcggcgtc tgcaatcact tcggtctgac cgacgaatgg acttgatcat    4080
gggtactttc agcaaatctt tcgcttcgct cggaggttta ttgcaggaga caagagcgtt    4140
atcaactacc tgcgccacca cgcccatcct atattttcag tgccagctgt acgccggcct    4200
ctacggcagc ggcacagctg ctctggacat tatgtttagc gaaccggagc gtttagcccg    4260
atttgggagc tgacgcacta ctcattgaac gcattccgca gtcttggatt cgaataggtc    4320
atacatcgac acctattatc ccgctttta tccgcaacaa cagaagacat tccaaataac    4380
ccgagacgct ttcgaagaag gggtattcgt aatccggtgg tctctccggc ggtagctccg    4440
tcgacaccct tattcgcttt cactcatggc tacgcatacg aaggagcaac tcgactttgc    4500
catcgaaagc tgcataaggt attcaagcag aacggtgtcc tgtaagtgta attaatgtaa    4560
cagcgtgttg cggacacgct cctttggagg aggatggtaa tgaataaacg ataataggag    4620
tagcaggcgg aagtgcttcc ggcaagagta cattgtgaaa aagctctgtg aggctttcgt    4680
cgaagaagat gtgcttgtac tctgcacgat tactattaca aggccaatga ccacctctcc    4740
cttgaggaaa gaagaagctg aactacgacc atcccaatgc tttcgacacg gatatgttcg    4800
tcgggatatt ctctctctga aggcaggcaa aacgatagag cgtccggtct atctttcgta    4860
gagcacaatc gtttgcaaga aaaagtaacc gttcgtcctg caaagtgatc gtactggatg    4920
gaatcctgat attcgagaac aaagagctgg ggatctgatg aatgtgaaag tattcgtcga    4980
taccgatgcg gatattcgtt ggcgcgccgc cttgtgcgcg atgtccagga acggggacgc    5040
aatatggttc ggtattggca caatacttca gtacggttcg gcctatgcac gaggatttgt    5100
ggaaccatcc aagcggtacg ccgatctgat cattccggaa ggtggttcaa ttcggtggcg    5160
ctctcactcc ttgtcgaaaa aatccgatcg gtgatcgtaa ggaagaataa cagccggata    5220
ctccgatctt tctctcaaaa ccaaacctta atgcgattaa aaccaaggct ttctttccaa    5280
aacagcattc cttattgtgg tggatagctg ccatcgtatc tgccattacg aaagctgctc    5340
ccacaggcac aataactata ccatattccg ctcctctttc tatcatttct ccgacatcag    5400
tcgctctatt cggcctatcc ggcagagcat cacgatgttt tctctacggc cctgtcttct    5460
ctatcctttt cgcccctttt gcccttttcc ttctttcata gggatgctgc tgtggctgtg    5520
cttttcggtt gccggatcct ttgggctgtc agccaattac ccacgagcga aa          5572
```

(2) INFORMATION FOR SEQ ID NO:495

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 495 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...495

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:495

```
tcctgctccc cggcaccaag tgcatggctc tcgcgaattg agaggtagcg cctttgccga    60
tattcttttt tgatcttatt ctacctgaga ttcgatgtcc ggcggaagta tttttcgaaa   120
aataagatct gataatctat ggcattagcc aataagctct gttgtgccct cccgggcgga   180
tggtaaaatc atgatcattt gctttgccag aagtgaggca tgcagctctt tgttgacatc   240
```

```
cagaagaaat cctccactcc gcaatctatt aggatagcaa gtgcggnccc tctcagctgt      300
cgaggttgtt gatcacagtg tactcgtccc catagcttcg gatctcggcc aaagagccaa      360
gcccgtctgc ttatctccca gttgttcgga aaggacgaat atccgcacaa ccgctcattg      420
cttcccacag gcttccgaac gcgtcctgat gccgaaaggc aatccataag gcgccgtgcc      480
cacccatgct gagtc                                                       495
```

(2) INFORMATION FOR SEQ ID NO:496

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 2487 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...2487

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:496

```
gcagaacncc gatgacatct atatgagcct tatgcgcnag tnggggctga tgatcaggtg       60
tggcagnccg gagccatcct gctgccggtt cggtccgtgg cgtaatggnc gacgagcgta      120
cctacgaata caccgtggca ctgcgtgcgt gacttctatg gatgccatga gtgccgattg      180
ggtgcatttg ccgtatattt tctggccaag gtgtcgaacg aaataatcaa taaagtgcgt      240
ggcgtaaccg cgtagtctac gacatctcct ccaaaccccc cagcacaatc gaatggaata      300
acaatgtcag cccatacagg aatctgtaca gcgaccaccg atctattcac tattataaaa      360
aactgctttc atgtccacgt accaaccgga agtactcgta aggtaactac acatcgcctc      420
atcgagatga agagccgtgg gagaaaatct ccatgctcac agcttatgac tactcaatgg      480
ctaagctggt gatgaggccg gtatggatgt cattcttgta ggtgattcgg cttcgaacgt      540
atggccggca atgtcaccac cctgcccatc actctcgatc agatgatcac cacggcaagt      600
ctgtggtcaa ggccgtcaag cgtgctcttg tggtcgtgat cttcctttcg gatcctatca      660
gggcaactcc aaagaagcct tgtgctggcc atccgtgtga tgaaggagac acatgccgac      720
tgtatcaaac tcgaagagga gaagaggtgc gcgagtccat tgtgcgaatc ctctcggccg      780
gtatcccatc atgggacacc tcggactgat gcctcagagc atcaataagt ttgcacctac      840
aatgtccgcg ccaaggaaga ggccgaagcc gagaagctgc ttaggatgct cacctcttgg      900
aagaactcgg atgcttcgct ctcgtcctcg aaaaataccg gccgaactgg ctacacgtgt      960
agcttcggag ctgagcattc ggttatcggc atcggtgccg gaggtggtgt ggacggtcag     1020
gtgctggtgt gcacgacatg ctcggtatca cggaggggtt cagtccccgt ttcctgcgcg     1080
ttatgccaat ctggccaacg agatagatcg ggcactcaag cattatacgc tgatgtgaag     1140
agtatggact cccccaataa ggacgagcag tactgacctg ttttccctga atcttacgtt     1200
ttcctcgcaa ttatcagcgg tcgacatgca tggaatagaa gaagggctta ccgaatttat     1260
cacttggtgc gattcctcgg aaccttttgca ttcgccatca gtggtattcg tttggctgca     1320
gccgacgctt cgattggttc ggagcctatg tggtcggtgt ggttacggct gtggtgccgg     1380
tacggtgcgc gacattttgc ttaatgtccc gccgttttgg agctccggcc ttcctacctt     1440
tttatctcta tgctcgctct catcttcacg ttgtatttcg gaagtatgta gtacgactga     1500
atcatacggt tttcattttg atactgtcgg gataggcttg ttcaccatag tgggtgtggc     1560
taaaacttcg agtgcggata tgcgtggtgg ctggccattg cgatgggtac gattacaggt     1620
cgttcggtgg tatgattcgg gatattctga tcaatcagac gccgctattt ccgcaagga      1680
tatatatgcc atggcgtgcc tgatcggagg agcggctatg tgggactcat gtacacgact     1740
ctcccgatcg aaatcataca gttcttgctg cctttattgt cgtggctgtg cggttcgtct     1800
cggtgaaata ccaatcagca tccccacttt ccgcggggcc gtataaactg ttcccaaaac     1860
agagttctct tttggtggca tcccccttga ctatcatctt attacgatag cgtggagtga     1920
tattccgctc tctctttatc gcgtttgcct tcatatgcaa ctgaaaaagt cgccaatcaa     1980
aaggcgactt ttttgctttt gactgtacta tgagcgtaac gcacaagtca tggaggagct     2040
ttagaggtat tcatatctta acgacactga aaaatcagtc aattgacaat gaaatctcca     2100
agaaaatccg tgcgacaggg ttttacagct catacgaac ctctctcccc gaacctccat      2160
ccggcagaga gcagatagca tcttccatca atagaccata gtatctctcg tatgagacca     2220.
tagtatcctc tcataggaga ccatagtatc ctctatagga gaccatagt atcctctcgt       2280
```

```
aggagaccat agtatcctct cgttgagacc atagtatcct ctcataggag accatagtat    2340
cctctcgtag gaaccatagt atcctctcat aggagaccat tctttgtatc tcggggaaag    2400
acaatgagca ggtttatggc tgccaagtaa acagagattt cccaaagttt cttcaggtat    2460
atacttgagg ttcgcaaaga ctgcatg                                        2487
```

(2) INFORMATION FOR SEQ ID NO:497

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 562 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...562

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:497

```
tacggatcat gtttccacca ctgttcatta tcacctaatg gtcgatagtc atacccaatt     60
gctcagaagt ataatttgct ccctgctgaa tcctttttc acggttacat agattgttcc     120
ctttgaatca atccccatat tgggaatata tacttgacgt taggctcatt actgataaaa     180
ggaggagcta tttcttccaa aagctctgtg cgtttccgcc caatacacct gacatcatta     240
aagccggcac agaataattt gttgaactgt tgttttcatt tccttttcga ttatagttat     300
tnatcatttt atttcatctg catctttcga ctacctactt cctgccattt acaatcagag     360
aatatacaga gcaaatccct gaaacacatc acatatgaca tatgccgaaa gataaataat     420
tatatcaaaa acgacaaaat ccaaaagaaa attctctgtt accgctcaaa atcggttttc     480
ggttttcaaa catgcctgca taaaatagca cacctctca gatngaggaa aataaaatcg     540
nccttgcgga caacagatcg cc                                             562
```

(2) INFORMATION FOR SEQ ID NO:498

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 1381 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...1381

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:498

```
atcggggaag tcgatcattt gggaaaatgt ggtcgtatgc atgccggtag atgggcttgg     60
gatatagccc ctgtgcgcaa atcggcatga ggaatcaggc attgatcaaa gagcttttgc    120
caacccccga atggccggca aggagtgcag cttgccatcg agtagggatt tgagatccgg    180
gaggccttcg cccgtatcgc cgacacgtgg cagcaggggt aacctatggc ggtgtagaca    240
```

```
gccgaagccg gtccaattgc aagcgatctt cttgcgtata gcagtctatt ttgtgaatac    300
aagaataacc ggtacgcgat aggcttctgc cgtagcgagg aaagatcgat aaagacggtg    360
gtagtcaccg gatcgttgat ggtacagacc agacggcagc atccaaattg gctcccagta    420
tatgggactc tttcgagagg tgctggctcg cctgatgata taattgcgtc ggggatggat    480
tcgtttgatg aggccggctg tccgtcctga gaagcgggga caatctccac gcgatcgcca    540
cggttacggg attggtggag cggatgcctt tcagacgcag attgccttcg ccatgcagta    600
tagctccgta ccatccgtgc aacgcaccag atactgatac ccgtattctt aattacgact    660
ccatccataa acggctttgc ggtgtataaa acagcgatga ggcagaatcg aaaaactctg    720
cttcatcgct gagtgataga ttttcacgc ttacacggtc atgatttcct tttccttttc     780
ggcaagagtt cgtcgatctt cttgatataa cgatcgtgaa ccttctgcat ctcgcctctg    840
catctttggc tacgtcctca ggagtaccat cggtcttgac gctttcttga tcgcatcgat    900
ggcatcgcga cgggcattgc gcacactcac ctggcgtcct cggcatctcc tttggtctgc    960
ttcaccaact ggcgacggcg tcttctgtca gaggaggaag gcccagacgg atcagctcac   1020
cgttgttctg ggcgtaatgc cgagcggaga gtccatgata gccttttcta tatccttgtc   1080
agggaacgct cccacggggt gacaacgatg gtcttcgcat cgggcgtttg atggatgcta   1140
cctgtgtcag aggagtggcg ttgccgtagt acatgacatg ataccatcga ggagtttggg   1200
gctggccttt cccggacgcc atgagcagct gctgtccaga tactcactgg cttcttcata   1260
ttagccgtgc tttgctatca gtcttttatt tccatatctc tatatgtgtt ggtttggctt   1320
gctttccttt caagcactcg tatttgaaac ataagtaccg atttctctct ctaacacttg   1380
a                                                                    1381
```

(2) INFORMATION FOR SEQ ID NO:499

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 751 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...751

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:499

```
ggccaacatg ggatcggata tgatgaggac tttgtctgtg atgtccggca tgctatgtat     60
tcgatgtgga tgtcgaaatt caggcggtcc ttatacttct gtaggcggat acaaaggcat    120
tttcacaata gtcgaaatag ttgaggagcc atgatggaaa ggcagtcctg ctcgaaggat    180
cgtagcgagc actacttgtc ttggggtacg gagcactcgg cctcacccaa gggcgtagtg    240
acggtcgcac ctgttgggtc atcttcttgc tgatctcata ggccattact tctccacacg    300
ttctatatta cgacgaaagc gcagtcgatc gttctgaata gtgcatcgcg catctccatg    360
acgaatctat tgagaagaga atgctcggca ccaagtgtat tacttccata attattgttg    420
aatatctttg tgcataaggc gttgatctta cacaccaaat aaagaattga agattattcc    480
tcagatgcaa ttcttatata attcacgttt ttcgttgaga gtcgctcttt ttgcctgatt    540
tgtgcctggg ccggacgtac gctgtcggcg caaacggaaa agtacaaaat cgcccctacg    600
ccgactacaa acgctatcat cttggatcca tgtagggatg catgcccagg atttggttat    660
ctccaacaac gggttgtacc cgaagggagt a                                   720
                                                                     751
```

(2) INFORMATION FOR SEQ ID NO:500

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 1899 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

(ii) MOLECULE TYPE: DNA (genomic)

(iii) HYPOTHETICAL: NO

(iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
       (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
       (A) NAME/KEY: misc_feature
       (B) LOCATION 1...1899

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:500

```
tcacacgtgc accactcttt ggcaatatct atgctgcggg ggctatcatc ccaatgacaa     60
agccaatatg gaaaaggtgc ttacaggaga ggtcggcttg gattcacgaa tcacaaaaac    120
ttcgagttca atatcaacgg atactatcga agtggatgga tcgcgtgacc tcgaagagaa    180
tcggaaacga gtatgttatc tcaatggcgt tgatgctgtt cactgtgggg tagaggctga    240
ggtcactatc gtcctattcg tcagatcgac cttcgcggta tgttctctct cggtactgga    300
cttggcaaaa caatgtaagt tacacttctt acgacgaagc cggaatgaga cagggcagga    360
tataacctat atcaagggtc ttcacgtcgg agtgcagcac agatgacggc tgctgtatcg    420
gcagacatag agctgttcaa ggtttccatg tcataggtaa gtacaacttc cttggcaaga    480
actatgcagg ttcaaccccg caacgcgtaa tgcacagcag tacgaagcgg atggcaaaga    540
atcgtggaat catggaagtt gcccgatgta ggtctgttcg atctgtctca tcctacaatt    600
tcaagcttgg ttcactcagc accacattct atttcaaatg gacaacgtag ccgacaagcg    660
atatgtgagc gatgccgacg acaatacatc ggtaagaaac acgatgaggc ttcggctctc    720
gtatggtacg gtttcgccgc acttggtcta ccggtattcg tgtaaacttc tgatcttaca    780
ctgacctact acataagacg gacgaagagg gtgtgtcaaa atgaaaattt tggtcaccct    840
ctatattttg agattctcct gaaagccgga tttaattata aaaggctgtg ttgaaattat    900
ttttcgattt cctctcactt tttgtcgaag cgtttggaat ttgtcgaggc ctctgcatgg    960
gggttgtcgc atttgatttg cggttcggga gattctttct cataggcatc gaaatagcag   1020
ggtgtagaat cggcttttgt tcctattttt gtgactatgt tgtgtgtgcc gtaaaaactg   1080
aaaaagcgag tacggtttac ttactaaata agattaagat gccttgagaa ggatcggatc   1140
agacgaccaa atgagaaatg aataacagat acaataaaaa taagaagaat aagaaaatga   1200
atagaatttg cgaattattg ggtatgaaca tccgatcata tcgggaggca tggtgtggtg   1260
cagcggttgg aaacggcttc tgctgtgagc aactgcggtg gtttgggact tattggtgcc   1320
ggaccatgca tccggacaat ctggagcatc acatccgttc gtgtaaagct gcacagacaa   1380
gcctttcggt gtgaacgtgc ctcttctcta tccggagatg gcaaaatcat ggagattatc   1440
atgagggaac atgtgcccgt agtggtaacg cagccggtag tccaaaggtg tggacagcca   1500
agttgaaagc tgccggtaga aggtgataca tgtagtgagc agtgccacat tcgctcgcaa   1560
atcagaggag ccggtgtaga cgccatcgtg gccgaagggt tcgaagccgg cggacatatg   1620
gacgagagga gactacgacc ctctgtttga tacctgaagt agtggagctg tgaacattcc   1680
tgtggttgct gccggaggga ttgcttccgg ccgtgagttg ccgctgcttt ggctttgggt   1740
gccgatgccg tacaagtggg gaccgttttg ctctgagtga ggaaagttcg cgcgcatgaag  1800
actttaaggc acatgcccgc cggtcggtgg aagggagata cnatgctttc gctcaaggct   1860
tgatcgccta cgcgactgct gaagaacaaa ttctatcag                          1899
```

(2) INFORMATION FOR SEQ ID NO:501

       (i) SEQUENCE CHARACTERISTICS:
            (A) LENGTH: 434 base pairs
            (B) TYPE: nucleic acid
            (C) STRANDEDNESS: double
            (D) TOPOLOGY: circular

       (ii) MOLECULE TYPE: DNA (genomic)

       (iii) HYPOTHETICAL: NO

       (iv) ANTI-SENSE: UNKNOWN

       (vi) ORIGINAL SOURCE:
            (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

       (ix) FEATURE:
            (A) NAME/KEY: misc_feature

(B) LOCATION 1...434

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:501

```
gccaacctat caaggaaagc aacatccaac atatactctg ccgcgagcct aggcgcgagg     60
ccttatccgg agtgatagca gcaagcaact cttcgaaggt gcacgtagaa aaatggcatc    120
attcgatgga tactcctcca taatatggga gtgagtatat gttgtttgac acctatttct    180
tcgagcagat caattaagag agagtctctt cgatagattt tgaaccgtca tccactgcag    240
gcaacgatga caatgtatat ctatcaggtc agtcaaccat ccttgttcaa agggttgact    300
tgcttcgntt ttcgcttaaa aatagaaaac atcctattcc tttgctcttc ttcatggggc    360
caatcttgaa tttcttcgtc ttcttggcag aagacgacgg agttttcttg ccttgtttgc    420
catactcctt ggtg                                                      434
```

(2) INFORMATION FOR SEQ ID NO:502

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 6954 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature :
        (B) LOCATION 1...6954

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:502

```
aaaagggcta ctacgcgcag catcatcggg tgttcgatga tttccttgtg aagttgtcca     60
ctgtcgggat cgtaatcttg agcatcacag gctcggtctc ttgtccaact gtgccagcag    120
ttctcgcttg aggatctctt ctgccttgcc ttttcggggc agtggatgtc tacctccggt    180
tcgaggatag gtactagcca tgagaaagaa tctcttttcc ccattggaat tgctgctcta    240
cgatgcgcga ataccctgct cgttggcctg cttgatcaca ctacgcatct tggtccgaaa    300
acgtggtatc cgacagcttc ttcacagagc ttgccgagtt cggaaacggc ttcatcagct    360
gtacgccgtt ggcttcgtcc tgaagccctt tgccactttc aggaagggga cgatgtgtct    420
tttctcccaa aggaagtctg cgtaggcatt ccttcgatct tgccgcgcat ggtacgttcg    480
aagagaatca accgatgatc ttgcccgtag cgaaagccgg agaagtaatc atccgagtag    540
catttggtga atgagatcga acatctcctc ttcggactga tatgcatcgg ttggataccg    600
tatgccttca gagctttagg ggtcgagcca ccactctatc caatgctcct acaaagccgg    660
gagcctgacg catctgctgc aattgtcttt gttcattgct tgtctatttt aataagatta    720
gcgaaatagc ttgtgttttt cttgttttcc tcaaaggtag agattatttg tgagagggga    780
cggtcgcaca tgaataattg attcggagga agggatcttg agggctaaag gtcgaggaaa    840
atcagccctc tcgaatatct actcatgatt gctgcttcgg agggtctctt agcaaggata    900
aatgcttgaa aggctnatac tgacaaatgc gtgatctcac tgattaagaa cgcgcattga    960
aggatcggat acacgatatc cgtacccgat cagtttgcgt gccaaaattt ttgcgcttgt   1020
ggtcgctgaa acatggcgcg aaaacttttt gcttttggcg tggaaagtga aaaattccgc   1080
gccacaacga aaaaattccg cgcaactttt tgggaaaaac acagacccaa ttttagcgtt   1140
ttgggttcgt gttttcgaat gagtgagtta cgggtatgct cdcaaagggt gatggcgaat   1200
cattgacacg acgtgtcgtg tccgtccgtc cgagcgtgtg attcatgaag gtctataaag   1260
aggtgacact gtaaacggca atcgtctgtg tgcggcgatt ttttccgtac acagccgact   1320
gcgatagatc ccgatctaca ggtaaacgtg caaaccgata gtgaagtcga acgattgact   1380
cccatctttt ccgaaactca tcccaaggaa ccaccgctcc gaagagcagt actcatgctg   1440
aataagggag cgatatagtc caatcgattg cgaatccgat accctggtat tcgattttct   1500
tagtgatgtc ggcttcatac gagaggcgat cagaccgaat ccgtagaggt tccctttcgg   1560
gtgacattat attggagtac gaacgaaagt ccgttgctta gcttttttctc cagctgcgct   1620
ccgaataaga cagccctttt gtccgattcg tgatggtaga ggggccaaat ggaatgaaag   1680
gtcgtgtacg ggtgccttga tccgagagcc gatttcccccc tttgacccga atcgtacagg   1740
agcgagtcgg gataaccttc tccccgttcc tcacgacaga atctgacaag agcataagcc   1800
cgcctatctg atgatggagc tgccgaagat agagggtcgt tggtgattga tcacgtacag   1860
```

```
gaattggcac cgctttttct ggtttcttcg cgagcaatct gcacggcctc cagtaggaga    1920
gactccggga taggccggat tcggcgatcc ttataagtgt gcagacgaat agccgggtct    1980
tccgtactat cggtgggcag cgtgattata gtctgcgctc ttcgttcggg agcaaatcga    2040
aagcattgtc ggagaatccg ctccgagtgc atccgtttcc acaaatagat ccttcaccaa    2100
atagggtacc gcactgtcag ctcccaagtc ctcaggcctg tccggcgaag ctcttggaga    2160
taggaggagc cacaggtagt agcaaatcct tgggcgaatg atgatataca gcgtggaggc    2220
ccagacttcg ccgtatgctt ctcccacatc ctcccaagcg acaggcgaag caggttcgtt    2280
cgctgcaatt cctgtggcag ccatgttcga tcgggaatgg caggacggtg gggtgttcgt    2340
tgtctacttc gaattcctca cccaaaaagt cggatagcgt ttcccctcga agctgatcgg    2400
ccgatgcgca gtgccatccg atcctctcct ttggcttcgg gagcatccga acgatgctga    2460
tcgtgcgccg ttcggcatct ggaacgatga taacgggttg aaagctctgc gtacctgata    2520
gtgcaacggt ttccagttcc cgtagtagct atgccggacc atgagatggc cggccatgca    2580
tcgttgagtt gccagtaagg ctacccatgc agtagggttt ggccgctcgt tgggcttcta    2640
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tctcgcagga tccgaatggt tcgcgtccgt accatactcc ccagtagtgg ctgtcacccc    2940
gaccaaagtg gctgggcgtc cccagttagc cgtgtcgggg gatgtctctc ataggcgcgt    3000
gtgggatcca atgctgccac acgctccggc agaagtcgca aaacagcttg tcgtagtccg    3060
tgagaaactt ctgataggtg gatcggtgga gcgttttttgc catccccagt atttgaggcc    3120
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atgtttaatc ggcctcttct ctcacattcg gaaggaattc cttgtcgccc ggatgggagt    3240
gcaagcaaaa gcgaaatctt gccagatgag aatcccgttc gcaccgccaa ctcatagaaa    3300
cgttcgtcct cgtatatacc gcctccccat accgcagcat attcatattc gcttccgaga    3360
cagagcggaa aagctcctgc catactcctc cgtgcgtgcg gacagcatca tggtgccggg    3420
gatatagttg ctcccttcat gtatagcggc tttccgttga tgcggaagaa gaagctgcgc    3480
cgtgggtatc ctcttcacgg acgaattcca cggttcggaa tcctatttgg ttcggtaggt    3540
ctgccatgtg gtaccgtctt tgtcctgaag acgggcacga gtgtgtacat caggggcagg    3600
cctatcccat tgggcatcca ccgatcgggg ataatacggt gaaagaggtg cgacaggaag    3660
gttgcccata gcctgcgtca gctcttcgct gtgcactttc cgtccgttcg ggctgtacag    3720
ctcccaacca aacggacaga gcggtcgttc tgctcgttcc aagagagagg aaaagacagt    3780
ttacctgagc atcttttgtc agcgtgtagg tgacttccgg ttcgatgcga aggctactgc    3840
cccttcgaaa cgtatgccga caggtcgcca acacctgtgg ttaccagtcg aggcccccag    3900
tcccaaccat agtggtaggg gctttttcgag tatatacact tagctttttcg ttgtggtgat    3960
cgttgtctga gggtagtcga aaccatcgcg ctgtctcaga gggcgtactt ccttcatggt    4020
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tctctgccga caaacatatt gtggctctcc attatctttt cccattgagg aatacggtgg    4140
cataggtgtc cagtccttct gccataggat ggctcgtagg cttcggagtt gctgttccgt    4200
gagggagaag agcaccgata atcccagtcg tgctcttccg gccattgtgc ctgttcctcc    4260
tgagtctgta gttgggatcg ggcagcaaac catgacggat aaggtcgtac tgacgactcc    4320
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agatggagtg tgtcggccga aatggtatgt ccgcttgggt ttggaaggtt atggatatcg    4440
ggatcaacca taggagaaag ttcggaaggt gttcttgcta atcatatcgg aaaggagaag    4500
aatacgagga gaattattcg tttcccggca actcctccgt ctcaggacgg aacgatgcgg    4560
tacattcttt ttgggcgaaa gtccgaggct gcgcatcttt tcgatagccc gacgatgttg    4620
ctacgggctt cgaccaattg accgcgggct ttggcagcgt ggcaaccgta ttttgggctt    4680
gttcctcggc acgaatgagt gtcttgcgaa agtgcagaac ttatcgtaca gcccgttggc    4740
ttgctctacg attgctgcac atttttcact tgccggtcgc gctgccatag atccagagcc    4800
atcgcaaagc tgcgatcagg ttggtcggat tcatgagcag cacgcgtttg tgtaggcctg    4860
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ctatatgccg gctgatgcgg cgatgtgctc ccccagcagt cgtttgcgct cggcttcatc    5040
ctcagagcaa cgaaggaggc ataggccgta agggatacct tgctgtcgat gatcactcct    5100
gaccgttcgg gtagcgaacg atcacatcgg gacgcatccg tctgccgtct catcgtggag    5160
gagggtacgc ccttcatcat tggtcaggt ctctggatga agaactcttc tccttcggtc    5220
aagccgctgc gtcggagcag gtttcgagga tcatttcgcc ccagtcgccc tgtactttgg    5280
ggtcgccttt gatgcacggg tcaggttgtt ggcatcatcg ctgagtcggc tgttctgttc    5340
gtgagctttt gtagctcttt ggcgagagag aaacgttcgc gcgcttcttc ttatagctct    5400
tttcgacttt ttcttcgaat agcttgatgt gttcactcac ggtttgagta tttcaccgat    5460
gcgctcttcg ttcattccgg aaagcttcgt gtcttgtctt cgaggatctc cgatgccgtg    5520
gccttgaaga gtgcttgatc tcttcggata tttgtccgga gcgtttccat tcgcgttcca    5580
attcggagtg gttgcctgca agcgtgtctc cagttcggta cgaatacgga tggctctttc    5640
tgctcctctt gcagatccgc cagcttctca gtggcagcct ccagtgtgct gtcagcctat    5700
ctgtctcagt gttgtgcctg cgatggaaga gcctacgacg agtccggcaa ctattgcgac    5760
gatgatgatt agccagtaca aaccatttcg cctataaatt ttactgtttt acgaacgaag    5820
gtaatcaata ctatgagacc tttcggcaat aagcaggcac tttgatccat tcattttaca    5880
tgtgtcggcc gattgttttg tgtgcttatg gtatgatcaa tgacacaaac gatggcacga    5940
```

```
cggggaaaat catccgacga agaggtctca ttcagggagt catgtcagcg aatcgataca      6000
ggaaagcccg gaatgtattt ttgacccagt cgatatgctt acatgagagg atactatggt      6060
ctattgatgg aagatgtatc tgctctgtgt cggatggcag gttcggggag agggaggttc      6120
cgtgcagctg taaaaccgat agatgagatt gtcgcacggc attttccggg agattcattg      6180
tcaattgact gttttttcagt gtctgtatat agatataaat agttcaaaag taaccgatac      6240
aggctatggt tcggaggaaa actgccattt gaacagcaga tagactgaga gacttgtatc      6300
aatcctcaat cttagcctga ttgcttcgac gtcttcgaaa agctaataaa gtagggtttc      6360
catgatgaag cggttgccta accgactgta aggagcaaag aaagagggct gtgacaaaac      6420
gaattttgac acagcccctt tcttttggaa tgccaatacc gacttaataa aacaaggcat      6480
ccaattcttt cttgaatacg tctttggact gagcaccacg agcttctttta ccacttcgcc      6540
gttcttgatg aacaaatgg tgggaattaa cgcacgccat acttcatggg caattccgta      6600
tttgcatcca catccctttt cctatgatag cgcgtccttc atattccgca gccagctcgt      6660
cgatatcgga cctaccatgc ggcaaggacc gcaccatgta gcccagaaat ccataccatc      6720
ggcttgcctt cagctaccaa gccgtcaaaa tgttgcatct gtatttgcag tgccataatt      6780
ttgttcgttt tagttggttg ttattcttgt tataatgatt ggtctattca agtgcaaagt      6840
taatctcata agtcttcaat tattcaccag ttcggggggac actttgatca gcgatttctg      6900
ctgtgccagt cgacatcgaa agtctccgta tggtcataca ctttgataaa taac           6954
```

(2) INFORMATION FOR SEQ ID NO:503

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 466 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...466

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:503

```
ccgaggatgt acccaatgca gcatttcgca tccgagggga gaaaacgtgg gcgtacagtt       60
ccatcccgag atctaccact cggaagaagg taccaaacgc ttggcaactt cctcgatata      120
tgcggtatga agcgtgattg gactccgctt ctttcatcga agcgactgtg caggaacttc      180
gcgaacgctt aggtgagaca aggtgatcct ggcactctcc ggaggtgtgg acagttcggt      240
ggtggggtgc ttctgaacaa agctatcggc cgcaacctga cttgtatatt cgtcatcacg      300
gcttgctgcg taagggcgaa ttcgagcgcg tacttcagga ctagagcact tgggtctcaa      360
tgtaatcggg gtgaatgcat aagaaaaatt ctcgcagccc ttagcggcgt taccgatccc      420
gagcaaaacg gaagattatc gtcgcggctt catcgaagtg ttcgac                    466
```

(2) INFORMATION FOR SEQ ID NO:504

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 558 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
     (A) NAME/KEY: misc_feature
     (B) LOCATION 1...558

   (xi) SEQUENCE DESCRIPTION: SEQ ID NO:504

```
gcctcggaca caaagccgat gaacgtgatt atggcatagg cgcccaaatc tgcgtctttt      60
gggtatcaag aaaatgcgct tgatgacaaa caacccggca aacgtatcgg actggaagct     120
ttcggcttgg agatcgtaga aaatatcccc tggaaactgc cccaaatcgc tacaacgagt     180
tctatctgcg caccaaaaag aacgtatggg gcacgagctg cacaacatca aataagaagc     240
gattcgcctc ttaacaggtt cttaaaaagg ccgtcggacg tttgtcatac gttcgacggc     300
ctttctcttt aatcggcgaa aggcgatgtg catgcggttt cctctcttta tccgttatga     360
aactgttgca caataacctc ccacctcctc attcgatcaa gacagacaca agcattgatt     420
cgacgaagaa aggaagtatt tatgcaatct cttcaaagct caagtatacc tctgatggaa     480
acttggggaa tttctgtttg cttggtagcc atatcttgag gtttgatctt tcctgaaaaa     540
cttagaatca gctctgcg                                                    558
```


(2) INFORMATION FOR SEQ ID NO:505

    (i) SEQUENCE CHARACTERISTICS:
       (A) LENGTH: 2192 base pairs
       (B) TYPE: nucleic acid
       (C) STRANDEDNESS: double
       (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
       (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
       (A) NAME/KEY: misc_feature
       (B) LOCATION 1...2192

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:505

```
gccggcttaa tcggccgaaa agattaggag catgagggta ttcgcagcaa tatctaacta      60
tcatttaatc gtttatctat ataatttcat tcggatgaag gctctcagga cagcgatatt     120
caactcctca tagagagctt catcgcgaca aatgtaagga aaagttcaa tcccctaaaa      180
ggcattagag cgggtaaatc ctttagcttt gtgatcgata tagtgtaatg agcgaagaat     240
ataagctgaa tcgacagttc gaatattgct caaaaccact gcttttcaag caaataaatt     300
cgcaatcttc ctttacacga aagccgacgt gagatagaaa cgaaagatgg ctatagcatc     360
tttggattcc acatccggca acaggtctca ttaatgctct gcaaaaagat aaatgccctc     420
agaaaacctg ccaaaacatc accgatttct aatgcaacag tcctgaaaaa gaaaaagaca     480
aagcaacagc taaattttca aatacaatag tcctcgctca tcctccaaac taataaggcc     540
ccgtcgaatt cttctacgaa tttgacgggt gcctacgttt tatcatctac aaacagcctt     600
tttcactata cgatttaata taaactgctt acaatctaca gaaagtaggt tctcaccgga     660
aaatatccgt ttcctaatct tttttatttac aacaatccct tggctataat ataagatata     720
gccacagaaa aacattgttc cactctctct gttatccctc tgtgaggaaa gaaattcgta     780
ttttgtcctc attatcaaag aataacaacc tactacgtgc aatcgaatat gctacgtcaa     840
aagaaatcag agagtcgttc aagacttttt ttgcctcaaa agtcataaaa tcgttccctc     900
tgccccatg gtgatcaaag gcgacccac gtcatgttca ccaatgccgg catgaatcag     960
ttcaaggata tcatactcgg aataccgagg ctaaatacac tcgtgtagca gactcgcaga    1020
agtgtttgct gtaagcggca agcacaacga cctcgaagag gtaggccatg acacctatat    1080
cataccatgt tcgagatgct cggcaactgg tcgttcggcg attacttaag aaagaagcca    1140
tcgaatgggc ttgggaatac ttggtgacgg tgttggtctg gatccccagc gtctctatgc    1200
taccgtattc gaaggcaacc ccgaaaaggc cttgaccgcg acaacgaagc ggcatcttac    1260
tgggcacagt ttctcctgaa gaacgaatca tcaacggcaa taagcatgac aacttctggg    1320
aaagggcgat accggtccct gcggtccctg ctcggaaata catatcgacc tggttcggac    1380
gaagagcgcg cccaaataaa cggtttggag ctgatcaata aagccatccg caggtcattg    1440
agatatggaa cctcgtcttc atgcaataca tcggaaagcc gatgcttccc tgacgcctct    1500
gccacacaag gtgatcgatc gggcatggga ttcgagcgtc tgtgtatggc cttgcagggc    1560
```

```
aagacttcaa ttacgatacg gatgtctttc agcctcttat ccgtactttg gctacgagac    1620
gggaatcgga tacggtgagg attctacctc ggatatagcc atgcgctagt agccgaccac    1680
atccggacta tcgcctttgc catcacggac ggccattgcc ctccaatgcc aaagccggct    1740
atgtcattcg ccgtatcctg cgcctgcggt tcgctacggc tacaccttcc tacactgccg    1800
cgaagcgttc atgaccgatt gctgccgaca ctgatcgata cgatgggcga tgcttatccc    1860
gattgcaagc acagcgcgaa ctgatcagcc gcgtgatcaa agaagaggaa ggagtttcct    1920
gcgtacactg gaaacgggta tccgcctgct ggagaaaaaa tagccgacaa taaggctacc    1980
ggctccaccg tattggacgg tgtcgctgct tcgaattata cgatacgttc ggatttcccc    2040
tcgacctcac agccctgacc tatcggaaaa tgggatgacg gtggacgaat caggcttcga    2100
cacggagtgc agaagcaaaa agagcgtgcc cgtaatgccg ctgccgtaga agccgggaac    2160
tgggtagtgc tacgtgaggg tgaatccaaa tc                                  2192
```

(2) INFORMATION FOR SEQ ID NO:506

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 608 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...608   :

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:506

```
ggncgttcat aatcttctgc gttttagttt cttattagct tgatttctgg tttacgttgg      60
aatatgagtt cggcaacatc tacggcaggc gcattgcttc gaataggttc tctccaagct     120
tttctatggc ttcgctcaat tcttcgaaaa accatcctct tttggtagcg caggcagaga     180
aagagcgtgc tttgcatttg ctctaacgca aaagagagtt tggagtagct acátgagcgg     240
tcgattgcga accactaaag ctgacaccat ccatagagaa ataactcct  tcgatttctc     300
agtttgcccc tttgttttga attgtacttc aatacctcgc tttgcagttc ggaggtaagc     360
tcttgccagt tcgtgcactt gggtagtgca gctttattgc atcgaagatg gcatacctaa     420
gttgatcatt tcctcttagg catgacgttt tacagcctct tttccttcgc cccatttcag     480
caggttaagc tcggtgagtt cttttgcagac ctttgttgag caatacttttt cattgctgtt    540
gaaattgttt tcccctcatt attcacacga ttgatacaga tgtgtaaggt gggtgcttcc     600
ctgtcaag                                                               608
```

(2) INFORMATION FOR SEQ ID NO:507

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 494 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature

(B) LOCATION 1...494

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:507

```
ggccgtaaag cgaaaaaaac ggattccgcc gctccgacag caaccggaga caggactgga      60
tggcttacct gtaaagaaca aggagtgtct tttcgtcccc gagaaaacga agccttatat     120
ccgaatggtg aaaaccggag gcggggaacc cgaaaagacg accgaacctt aaccttacta     180
tctgataccg aagggtcccc gtcctccttt ttccatggcg gatacaaatg tattgaatta     240
taaactgaaa tccaatcgta tgaaaacacg aaaaacgatg tgtatcgccc tgttcttacg     300
acgctcgcaa ccggagcttt tgcccagggc aacggcatgg ccgaatcaac gaagccacca     360
agatggtaac ctcctatttc gacccggcca cgaactgatc tacgccatcg gagccatagt     420
cggcctgatc gggggagtca agtctaccag aaattttctt cgggagaccc cgattccagc     480
                                                                       494
naggaccggn gcct
```

(2) INFORMATION FOR SEQ ID NO:508

      (i) SEQUENCE CHARACTERISTICS:
          (A) LENGTH: 974 base pairs
          (B) TYPE: nucleic acid
          (C) STRANDEDNESS: double
          (D) TOPOLOGY: circular

     (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

     (iv) ANTI-SENSE: UNKNOWN

     (vi) ORIGINAL SOURCE:
          (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

     (ix) FEATURE:
          (A) NAME/KEY: misc_feature
          (B) LOCATION 1...974

     (xi) SEQUENCE DESCRIPTION: SEQ ID NO:508

```
agtattggca cgaaggcctt cagaaaataa cggtgatcaa tccccttatc ccacttcgga      60
acaagggtgc aaagcctttg ccgacaatac ccccgtgcat tcgcccatgg tatcacgcac     120
ctctatgacg aactgccgca ccacncctgc agtcgctcaa gcatcgtctc ctcacctatt     180
tcggcaagac cacttatatc gtatctaccg caaggaacgc tacatcacca tccaagagca     240
ggacttatcc gtgacagctt tgtccgggcc ggattttcat ccgatctgat ccgcacgatg     300
cgatggtgta catgtacgaa ctgcagagcg ccatggtcaa gaggactgaa tcctccgggt     360
agtacgtaac catcgactat aggccgatgg aatttcacag ctatgaaact gcggtttcat     420
agctgtgaaa ctttatttc aagtcgagaa actatagttc catggctgtg aaactgtaac     480
cggcctgcac gcaagaaaat tttgccgtac gggaaaaaat ttgcttgtcg caggagagtt     540
atatccctcc ttatagaagt ttgaaaaatg gggcgggtta ttcgattcca taattcggat     600
taaataaata catttgcgag aaaagcgatt gccatgataa caggaagata aacccgtttg     660
tcgtgacggg aaaaatcgaa ccggaaattt ctgcgaccga gaatccgagt cggcgcgcct     720
catcaagtcc attgcaacgg caataactcg gtggttatct cgccacgtcg aatggggaaa     780
acggactgat ccaattctgc tatgacaagg aagaaatcgg caggaactac tatcttttt     840
tatcgacatc ctccacacat cgagcctgcg cgaatttact tactgctcgg ccgcgagata     900
tacgaagact ctgctgccac agagcaaaaa gtgatcaacc tcttcgtccc gcaccctcaa     960
                                                                       974
gtccgatcag tgga
```

(2) INFORMATION FOR SEQ ID NO:509

      (i) SEQUENCE CHARACTERISTICS:
          (A) LENGTH: 602 base pairs
          (B) TYPE: nucleic acid
          (C) STRANDEDNESS: double
          (D) TOPOLOGY: circular

     (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

(iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
    (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...602

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:509

```
agcaaactat gagtatatac gaatcggctg taaaaaagcc ggtcacaaca tattgatatt      60
cggggcgata gctattttcg ggctattctc actgagtctc tttccatcga cttgtatccc     120
aagattgaga cgagcaatat catggtctga cctcctatgc cggagccagt gcatcggaca     180
tagagaacaa cgttacaagg tcttggagaa tacgcttaac ggggttagca atctcaagca     240
cattattcga agagtcggga gaatgcttcc gtcattacgc tccaattcaa tgaagtgtgg     300
acatcgaagt ggctaccaat gatgtgcgcg acaagctcga tgcgtctcca acttcctgcc     360
cgatgatgtg aacaaaccga tgatcttcaa gtcggtactg acgatattcc tatcaccatg     420
ctatccgtgc aggccaaaga ggtacgatgg ccctgtcgaa gatcctcgaa gacaaggtca     480
cgaatgctct gcacgccttt gatgggcgta gtgcggtgag cattatgggt actgtgaagg     540
ggaaatacaa gtgtatttgc gaatccggcc aaactggaag catacaactg accgtagaag     600
ct                                                                    602
```

(2) INFORMATION FOR SEQ ID NO:510

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 443 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...443

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:510

```
gcataaaagg agcgagtgaa aggggtggca gtaaggagtg aaagtagttt aacccccccc      60
ttgaggagct acttgcacga gctcctcaag agaccattca cggcattttt gcgacatatt     120
tgcctgcatt gcttgcgtat atcaatgtat ttagtatttt acacgtataa acaagagcat     180
aaatatggca accaaaaaac tgaatcggca ccaagctttc tgcaagtata cactcagctt     240
cgcaggatcg catgaaacac tctttcctgc gtcaaatcaa tgccggtttt gattgcgtgg     300
tatttcgcac actgctgaac aagaaataca ccaagacaca gaagcncata ggtaaccctg     360
cctacgatgc gctgttgatg ttcaagaatc tatcttggag acttggtatg gttttgagtg     420
actacgaagg tttgtggagt gat                                             443
```

(2) INFORMATION FOR SEQ ID NO:511

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 838 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

(iii) HYPOTHETICAL: NO

(iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
    (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...838

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:511

```
aggatggcag ttcgtatgag aatatggtga gcacgcatgg acagccgctt cggctgccgg     60
agcatcattc gccgaaacgg tcaagaacct cggaggcatc ccgaagagcc gttcgccatc    120
ttccccgaag ttcgggaaat gtatgccctc gcttggcaga actggagcag atcatggcag    180
agcgtcgcga agaagacaac gttggcgcag cacccatcct gatttggcag ccaagttcga    240
tgcgtgtttg ccggtcaaac gccccaaatc gactggaaag ctatagagca gaaaccaatc    300
aggctacccg ctccgcttct gccaccgtgt tgggtactct tgcggagaag tggagaatat    360
gattgtaacc tctgccgacc tttccaattc agcaagaccg atggcttctt gaagaaaacc    420
cacgccatga agaaaggaga ttcagtggag cattcctgca gatgggtgta tcggagctga    480
ccatggcctg ctctgtatcg gtatggctct tcatggaggc gtcattccgg cttgcggtac    540
ttcttcgtat tttccgacta catgaaaccg gccgttcgta tggctgcctg atggaattgc    600
ccgtcaagtt tatctggacg cacgatgctt tccgtgtggc gaggatggtc ctactcacga    660
accggtggaa caggaggcgc aaattccctg atggagaagc tgcacaatca cagcggccgt    720
ngctccatgc tggtcttcgt ncggccgatg tgcaagagac taccgtagct tggaagatgg    780
ctatgagaat acgcatactc ctacagctct gatcctttcg cgtcagaata tcacgatc     838
```

(2) INFORMATION FOR SEQ ID NO:512

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 3275 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...3275

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:512

```
gaaatcttcc aaatggctat gctcgaaccc aagctggcta ttttggacga accgatagcg     60
ggctcgatat cgacgctctc cgcatcgtag caggcgggta aaccgactcc gctctccgga    120
gaatgctgct attgtgatca cacactacag cgtttgctcg agtacatcaa gccggacttc    180
gtacacgtcc tttacagggg cgcatcgtca agtcgggagg aggcgagctg gctctcacgc    240
tcgaaaaaaa ggctacgact ggatcaagga agagatagga gaataatcgg atataaggta    300
gaagaacaat atctgcaact cttccgagag aatcgcgaag caaagacagc cactccccac    360
gggtactcaa tgagcaacgg gagaaggcgt cgtggctttc gcctcgaagg ggttgcctcg    420
gtatggcact gagaactatc acgtaccgat ttgtctgaac tattcggtta tgactacgga    480
gtaaacctga tcgtgtcaat ttcccaatca gacagaaaga agcttttcat tgtacgttgc    540
ggatttggac acggatcttt gctacattgt caatgatgca tacgataaga atggagtcgc    600
gtatccgaat tgccggaagg agcatttgtc ggcagtcgag cgattttgcc ctcagccatc    660
cggagatagc agctcgttat tatgctaagc cgctgcaccc gatcacgatg gcatcattgc    720
attcagcacg atgttgctca agatggattc atcatatatc tgccggatgg tgctgtactg    780
aagatccgat ccagctcgta caactgctca gagccgacat ggagattctc gccatcgtcg    840
gttactcatc atcttgggaa aagatgccga agcctctctg ctatatgcga acacacgctg    900
gatacgcatt ctttcctcgt aacggaagtc gggagatatt cgctgcggag aacagtcgat    960
```

```
tcgccttgta cgatcttgaa aaagcagcaa gaataccaaa cgtatagcat cggttcatgt   1020
acgtcaagcg agaattcgaa tgtgacgatc aactgcatga cgattcacaa cggtctgaac   1080
gcaacaacta ctactgccat cttgaaggag aaggggctga tctgacctgg gcggaatggc   1140
tattgccgaa gggaaacagc atgtcgataa ctacagagga tagagcatct cgttcccaac   1200
tgccaaagca atgaactctt caaatcattc tcagccggca ggcgcaggga gctttcttcg   1260
gacgaatcta tgtgcgaaag ggcacagaaa acggcagctt atcagaacaa tcgcaacctc   1320
ttcggatgat acggctcgca tgtactccaa gccgcagttg gagatctatg ccatgatgtg   1380
aagtgttcgc atggtatgac tacggggcag ctggacgacg agctctcttc tatctgcgtc   1440
agcgcggcat tcctctggct gaagccaaga tatgcttagc gtggccttta ccgatgatgt   1500
agtcaagctg gttcatatca gcagcttcgt gaacgtctgc gcgacattat cgaacatcgg   1560
ttccgcgggg ctgcatgcg tgtggctcct gcaatatctg ctactaaaaa tatttttct    1620
cgtcctacaa aagctttaca gctattagga caagaaaaga ttggttctta tccatcagca   1680
aggacgtcct tgctgatgga tttgtttttc cggagagagt cgagctacgc tctacagctc   1740
ttcgagttac gctgtacggg atagtcatca tcctctacgg acgtcagttc gatctaagcg   1800
gaaataggaa agtagggttt ctgatgattt caatattgag ttcaggcttt ttaggcagga   1860
tgtgtaagcg atgataccgg agatcaggtt ggtgacaaaa ttgttgacac tcgatgtctc   1920
gtgtgctcta tctgacagac atttttgagc atatcattga cgtttcgaac agggctctct   1980
ttctcaataa aactttgtca tatagatgct cagggagttc ttcatgttct ttttgatttt   2040
ggttatcatg tggatgtctc gacaaagagc cggtcaaaaa ggttttggga aatgtagcct   2100
ctatcggaat gagtttgcca aaaagattct tggtgaatgt tccgtctttc agaggtctct   2160
gtcatcacaa ttgcccggtg tgatttgata gttgatgatt tcaccctgtc gttgataaca   2220
atatgtagct tgaatccata aaaccaaccc atgggctttt gcctttttga gcccatcccc   2280
tcattgtcct atgcccacga gctgtttgat atgacaaacc ttcagtgggg tggaatcgat   2340
gaaagagatg ccgtacattg acccaaacaa cacatattga gaaatgctat cagcttgaaa   2400
ccaccctgct ttgcagctcc acaaagcgat tataagagac aagatgtgga actcggatcg   2460
acaagaatgg gtaatgtatt gaagataaaa agctttcaat ctcggtatct tgacagatga   2520
aacaggatca ggatggtcat gacctcacgt ccgacatctt aaactttcta ttcctgcatt   2580
ttttgtctgc ctcttcgggg tcttttttctt gattgtttca tcaaaaagct tggagaaatc   2640
atctatatgc aaaaaacatc aactatattt gtcttcataa agtagcgttt tgttttttcgt   2700
atcttattga ttatcaactg ctaagataca aataattcgc tacttttcaa gcataatgcc   2760
catgttcttt gggcgtttac cactaatcag aaacaaattc attggctttt tcttacgtcg   2820
aactgacgtt attttttaagg tcacgtaatc cattgagcca tatggttcaa tggaaaagcg   2880
caatttttaa tccccctcgt attcagaaga aactcgctcg aatgaaccca caacaactga   2940
aagcatgcaa ttttaatgcg tcagccctag ggaatatgta actcggcacg cctcggtaac   3000
tactgtaaac aaccgaggca gacaaatttt aactatcggg ttaagcgtgc agcgatgaca   3060
taatggcact agtactacca aataaaaaat cgagacatcg ctctactaat aacttcctgt   3120
caaactttat ggacagattg actatcaaac cctacaaaaa agacatctct gaatttggaa   3180
aatatgaaaa ttatgattta gtcgcataaa cttacatcga actcacctta tgagcctttg   3240
aaaaataagg agatggaggg aaaaggagaa agcaa                               3275
```

(2) INFORMATION FOR SEQ ID NO:513

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 546 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...546

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:513

```
ggagaattgc tgtttgcaga ttttatttcg ttcgaatcct gacanaagtc gaatttttgt    60
gccctctaca tttcatttttc gcttaagttt cgaaccgctc gaaggtgtgg catgtacaga   120
aaaagggttg acagttggag agaatcgttc aactgtcaac ccttttttccg tatggtgtca   180
ttcgccggag gaatactgaa ggtattaagc atccatgcag ggtaggcccg attccgacag   240
```

```
gcttattcct tgatagatca ggttctcccg ttggatcagc gcagggctgc agaagcttat      300
cggtcagttc ttcgccatgc agattacggc cgatgatagt gcctcgttgt cgatcagcag      360
ggtatgaggg atagaatgga cgccgtattg caagctgccg ggcttgccca gnctttgtaa      420
tcggacattt gcggccatgt gtaccgagcc ttgcgatggc tttcttccat gctcccggat      480
tttcatcgag gaaaccccta cgatctcaag tttccccttg tagtcggcat aaaccttgac      540
agatcg                                                                 546
```

(2) INFORMATION FOR SEQ ID NO:514

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 1119 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...1119

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:514

```
ggagatcaag accgtgaata ccatcggacg agtattcata tcagccaatt caggcgttgg       60
cgcagttctc tnattgtaag gnccatcgat ctctccttcn tgcgccagag gagaatgagt      120
ataatacctc ctatcatacc acccaaagag caaagtgatc gatgttgcta ccacctgcca      180
tcggtgcaac accaagaaca gctctacaag gccgtatata ataacaaacc acttggcttt      240
gatggaatgg ggataaagaa aaggtagatc tcaccattgg ggaagagcat cccgaggcca      300
atagcaaccc gaatacggct ccggaggcac cgaccgtcgt tggaaattga ggaaagcact      360
cttgagcatc tccgtaccct ccggaaagcg aaaaactcgg ccggactgtt cacgatgggc      420
atcagatcca cagcccatac gtctgctgtg ccaatgcagc cgtaagacca caataacat      480
agaagatgag aaacgcttcg cccccaaaa ctgctctatc agccgtccga acatccatag       540
gaaaacatat tgaagaagag atgcgagagg ccatcgtgta agaacataag ghaacgaact      600
gtatgggatt gaaactgtct gcctgaaaat aatgcagccc atggtatcgt tcagatcgat      660
attgaatcgt gcctcaagta cgtaagcgcg aacaggaata tcgcattgat gatgatcagg      720
ttctgcgtta cgggtgagca aactgataat tcctttctct aaagctattc atattatgga      780
ttgtcttgtt ttctatttca ataccaagta ttcgtgatgg gacgattgct ctgtgatant      840
tcagatcctg caagagtgaa ctcttcnccg atatgacgaa anataggact tgtatgctcc      900
tatagggatg aaactggccg agatagccca gagtgcatgt cgcgagtgac gttgcaggta      960
agcgatgtta ttttcttcaa tcgaaattgt agttcgcatt gaatccgaag ctccagttcg     1020
gtgtaggctg atattgccgc gnaagctcac cctctgcgtt acccggtagt agtgctcctn     1080
ttantgacnt tgtacntatg gcagtcggta gcaatattc                            1119
```

(2) INFORMATION FOR SEQ ID NO:515

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 1290 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
      (A) NAME/KEY: misc_feature
      (B) LOCATION 1...1290

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:515

```
ggacggaagt atgcgcagat gaaagagcgc ggccttaaga tgaaggaatc gacctttata    60
atcccaacgg cacatcgctg aaagatgccg tagtgctatc gacggaggat gtacgggcga   120
ggtcgtttcc gatcgcggac tggtactacc aatcaccact gcggatacga tatgatccag   180
gctcacagca cgctcggcat aactatctcg aaaatggatt ttgggcgatg agagaagcgg   240
atgaataccg aacaaggata tttccgtggt attcatcgac aagatcgaag atgtacagac   300
tacgtcaaga aagatctcaa agccatcaaa gatcccaaca gcaggactac ctctctccga   360
agtacctgca aaagttggct gacaagaagg ccgcaagaac ttttctgcca agaatccggg   420
gctttccgta gagatcaaag cttctatggg ggcaatctct acctgatgtt taccaaaaag   480
acttatacgg tgttcgactg gtgggagcac ctcccaccag cattggcaaa ttcggtgcca   540
tacggacaac tggatctggc ctcgtcatac tggcgacttc tccatcttcg tatctatgcg   600
gacaagaatg gcaatcccgc accatactct gaagatatgt tccgctcaag ccgaagcgtt   660
tcttcaatat ctcccttggt ggagtaaaga gaacgactac gccatgataa tgggtttccc   720
cggtactacg caccgtattt cacggcttcc gaagtagacg aatggaaaag catcgacaac   780
gatatcgcat ccgcatgcgt gatattcgtc agggtgtcat gctcagggaa atgtggccga   840
tcctcagatc aaaatcatgt attcagctaa atatgccgct tccagaatgc ttacaaacgt   900
gctataggtg ccaactgggc gatcaagaca ccggcctgcg tcaaaacaaa caggcgatgc   960
aggacaggct gatcgcatgg gagcgaagca gggtactcct cgatatgaag aggccgtaca  1020
cgaaatcgag ctacggtagc caagcgtgcg gatctgcgcc gtcgttattg gatgatagag  1080
aaggcatcat ccgtgggatc gagtttgccc gttctcctat ccccaccaag atgagacgaa  1140
agctctgcaa ggcaatgatg cttcggctcg caaggagcga tcgataagat tcgtacacgc  1200
tacagcaaat ttgccaacaa ggactcagtg cagaggtgga caagaaagtg gccgtagcca  1260
tgctgacgga atactcaagg aaatgcccta                                    1290
```

(2) INFORMATION FOR SEQ ID NO:516

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 3212 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...3212

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:516

```
aaaaaattgc agattcncag ccccagtggc ttgcccatct atgccatcag aacaaactcg    60
tcaatctcga cgaaatcgcc cacttaaaca aataaattga agcctaatcg ccgaccttgg   120
aagtaagcaa agaccaaagt ttatcatcga gggaagagga gcggtgagat cgatgagaac   180
gccgctgaca ggatgatgaa acgaattcga tgggccagca gactgattcc tccatccgga   240
ttactcgccc gaatccgtat ttcaaatcgc ccttgatagg acaacccata gttggagctg   300
gcaacgaatc tgatggtgcc ggccagtatg tagctctatt tccaaagatg gtaattgtcg   360
gacgaagcta ataagcgata agagagagaa gcttcttact gttcggcact ttgcataccg   420
aagcaaagct tttgttcagt cttcgtttcg actgatataa tggacgagcg tatctccatc   480
cttgggaggt tttgtttgac tatggcacga tatacctttt gcaccttccc atcgcgaaaa   540
tattattgag tcgcgccaaa gccttactcg ttttggcaaa aacgaccatc cggccacagg   600
acgatccaaa cgatgggcta caccgaggaa gactttgccg gcttgacata tttctctttg   660
atccactgct tgaccgtttc ggacaggggc tgtcaccagt cttatcgcct tgaacaatct   720
ccccgacagc cttatgacta tgatcagatg attgtcttcg taaacgactt ccataatgac   780
agcctatgaa ccgaacaggt tgattctgat cctatattac atattcatac cgcacaaacg   840
```

```
tggactacct gtcccgtcac gtacgaagag aggtcactgc caggaaggta gctacgttag      900
ccacatcttc gggcgtacca ccacgacgca gggtatctgt gccgcccatt gcttcttcac      960
ttcttcgcta agcacggcag catatcggtg atgataaaac ccggtgcaat cgcattggca     1020
cgcacgccag tgagcccagc tctttggcga cactcttggc caaaccgatc ataccggctt     1080
agaagctgag tagttggatt gtcctgcatt gcctgataca cctaccaaga agccatattg     1140
atgatactgc cggtgcgctg tcccatcatg atgggatcac ggcatggatc atgttgaacg     1200
ctgacttcag attaacgttg atcacgcatc ccattgttgc tcggtcatac gcatcataag     1260
gccatcgcga gtaaaccggc attgttcacc aaaatatcga tccgaccgaa gtcagccttg     1320
atcgttccac cactgtatgt ngctgcatcg aaatccgctg cattggaagc gttgccgctg     1380
cacgtactcc gagccctttg agttcttcta cgaaagcctg tcgccctcat cgatattcag     1440
atcagtaata gccacatcgg caccttccgt gcatacttat aagctatggc acggccgata     1500
ccgcgtccgg ctcccgtaag agagctacct tgttctccaa taatttcata ctttgatttt     1560
aattagtctg gacagatacc taccgatacg atatgtatgt ccgcgaagtt tatttatgat     1620
cgttaaattc ttaaacactt tcacttccaa tctcttcttc accgctttta ctgccggaga     1680
gagacagata ccgtggaaga tcagatgctc cacatctcac tgattcgctc gaacgcgatc     1740
gttccggcat gcctaagatg tccgtgatat acggcacttc cagccccttg attgagtgga     1800
gtaagatctt ggcgtaatat gggtatcggg tatagaaaac gcattaagcc gaacaccttc     1860
gtcaaaatgg aacagatcag atgttcttcc ttgaggtcga actccttacg acagtctcca     1920
ccttccatat atcacgaaaa aaatcggcac gaagcgtacc ttgcgcacga caatctcttt     1980
gattgcttcc aaatgcgtat agatgaagtc atcagcttct tagtcggcgg catagacacg     2040
agagcagcag tctccaacag ctgtagagtt cgtccagctc cttatggaca acggcaaaat     2100
agatatcttt ttgcttttga agtaagtata tagcgtgcgt cgtcccttgt ttgccgatcg     2160
gcgatgtcgt tcatcgtggt cttctccaca ccgatcttgg caaaggctga cgtgctacat     2220
cgatcatcaa gttctcttgt tttcgccaca ctcataaaat ttttcgattg ccctatattc     2280
tatacggcat tctgtttcgg aacaatataa ggttttggc gttgattttg cacgtttgtt     2340
tcagtattga gcaaaaagtc caccgtctta gcctgtatat tggcttggac ggttctatcc     2400
atatccaaga aaagttcgat cgaaacaaat aaaaaagctg tctcctttga aggggacagc     2460
tcatcgatca ttcttgttgt ctcacaagga ttcgaacctg acaaacagga ccagaatctg     2520
ttgtgctacc attacaccat gagacaatgc gaagccttta ttgcttccgg tgccgcaaat     2580
gtacaccttt ttgtgaacaa acaataaaaa cacatttgga tttaattgg catccatatc     2640
ttcctcatag agttcgattt tgaaaagatg ggttggaaat ctcgatttta ggttctaaac     2700
cggaaacacg gtcaagatat tttagtcaat ttttctgtcc gttttgtact tttgcgagcg     2760
taaagaccga aaaaggtcat acatcagcat caaggggttcc atctcaataa acatcgatga     2820
agaatatccg caacttctgc atattgcaca tatcgaccac ggcaagagta ccttggccga     2880
tcggttgctc gatataccaa caccgtctcc ggcaaagatc tgcaagatca ggtcttggac     2940
atatggactt ggaacgagag agaggtataa cgatcaagag ccatgccatc agatggacta     3000
tgagatggat ggagaaaagt atgtgctcaa cctgatcgta ctccggggca cgtggacttc     3060
tcctacgaag tctctcgctc cattgctctt gcgaaggggc attgcttatc gtcgatgctg     3120
cccaagggat acaggccaga ccatatccaa tctctatatg gcgatcgaaa acgacctgac     3180
catcacccta ttgtaaacaa agtggatttg cc                                    3212
```

```
ggggtaacct tcgcgtatct ctgagtcgtt tgcaggttcg aatgtcccac atcttacaga      .60
tagtttctat ggggactcct gcttccagag taatcaataa gcgaaggaat gccttccggc      120
atggtaggtc aggtcttcct ttatgtcgcg agaaccgcaa ggcatttcat caggcgacgt      180
```

```
agattggggt ggtacacatt ggaaagagtg tcggacgggt atcgtcgttg tatttctcta    240
tcaatcaagg gcttcgggca ggagtttgac acaggcttga agttcgtttt tcttcgacgg    300
tatttaagcc atagacttcc ttcatcatcg gtgaagagat tgttcgtgta accgataccg    360
catcagcata ggaagttccc gtatagcagg caagaggaag agatctcttg ccaagatatg    420
agagctacga tgttcgggaa taccaagtca cggatttttct caaaggattc ccgacttagg    480
gctttcggtg cttctcctct tgcttgggga gactgaaatg agcgaaaaaa catttatcgc    540
atagccttcc ttgtaggctt tacggcatac ttttttgatg atggccagta gtgtcggctg    600
gtctctatgg taagcccttt gtcgtccacg acaaaaactg atagtcgtga atgaactgtt    660
cggtcagctg accgaaggca atgtcctgga gtggaatttc ttttgaatga actccgccaa    720
ggttcttcgg gtgtaaaata ggcggggtat gttccttttg cccggtctat cccgatacgt    780
ttacgagttc ctcgcagacg atgtccgtca ttgccagcaa ggtcatctgt gttcgagact    840
tccctgaaac agattcttga ccgcttcggc atcaaagtct gcttgcgttc caccaaggtg    900
tcgaatgcag catgaatgga aagcaacaac tgtctaattt ggcattgacc tctactgctt    960
cattgctttt accgttcaat gactctcacg gggattccat aagtcaggag tacaggagag   1020
tttgcaacta actgcaccat cgaacgattg acggtaatgc gtcccatgat cggggcttgc   1080
ccgacttgtc gggtctgctc tttttcaggt agagcaacac cttgaattct ctatcttcat   1140
acgctttaac tttatgggca aaattacccg ttatcaagcg ttctctgata cgcaaaatat   1200
tgataaacag ataaaaagaa accgttgaga aaaattcttc caataatcat tacctcagtt   1260
tgttcgggaa acaaaggata acggtttggt aactgaaagg tctcaatatc ccatactgtt   1320
ttgctatccc tatctgtcgc agaacataga aaaacaacta attcacaacc agtaccatat   1380
ttccacctat gttcctctta cgcttgctta ggcttgtatt tccacatggc ccggcacaca   1440
tttgccacga tgtctttgag caaaggcgtt ccatcgaatc cgtgtcgaag atgctgggac   1500
acaccaatat caaaacgacc agatttacgc ccgtatcacc aataaaaaga tagaacagga   1560
catgcttagc tatcggataa gctggatata ttcagatctc cggtgtcaca agcaaaaat    1620
gacttgaaat tgaatacaaa ttctataaat caatgatatg aatacataac agcagatgta   1680
agcgtcatcc ggaataaaat tcttagagat cgtggaacag agtgatattg gattatcatt   1740
tggccgaact ctacggtgtg cagaaaaagt gctcaaacag gccgtcagga gaaatttgca   1800
gcgcttcccg gaaatttttat gttcgaactt accgaaaacg aatggacgga actggtcaca   1860
attgtgaccg gttacccgaa accctcaaac acagttccgt tgctccgatg gttttaccga   1920
gcaggagta gccatgctat catcggtgct gcgcagtccg cagcaataga agtgaacatt   1980
gccatcatgc ggactttcgt tgccatgcgc ggatgattgc cggttatgaa gaactcaaaa   2040
agcgtatcga agaccttgag taagctgtaa tgtgcagttc agtgagttgt acacggccct   2100
gacggagtgt tggagcaaaa agaaaaagcg gaaaagcctc gtaatcccgt cggcttatca   2160
ttccggggat cctctagag                                                2179
```

```
tggcccgcga aacggtnaag ncaagattaa gatnaaatgt caaaggccgt ctgacgtcag     60
gtccaatcgt tttgctnata cactcgaaat gaaggaagcg atgataatgt gccggcttgt    120
ggcaatcaat accatcgaaa ttgtcaagtt gaggagattg aaggtttgtg gtgtgaaggc    180
gttcagtgtg cagaaatttg gtcgtcacgg gtgccaacaa gtttgaattt gagcttgata    240
agcctacttg gatattacgg ttatttcagc agtatcgact ttcagtggtg gtaagaaaat    300
cttacaattg agtataaggt aagcaataca tcgaccaccc agctctgaaa ccgggagcgg    360
ttgtaacgct gttcagcgat aaggataaca ataagtcttc tccggcggag atgttgctgt    420
tgcaacacag gagttggtcg cgaaataact aataccacac ctcttacgca gataatgaag    480
gtaaaaggag gagctcttcc catacgggca atttggttct tacgatactg cccaaagacg    540
```

```
ttgctactgt gagatcaaat cccctatggt cacgttaaac catcttcctc gaattactgg    600
atcggaggaa ctgtaggtaa gcctaacgaa tggaaaggcc gaacaactgg accaatgacc    660
aagttcccga tgcggcagag gatgttaatt cgccactgag gtgaataacc cgactgatcc    720
gaataatccg aagtcggtcc tgcgaaggag aacctgcatc tggacgatat acaccagaat    780
ggcaagccgg tcgcgttatc ggcaacctga tcaatgactc tgacaaagat c             831
```

(2) INFORMATION FOR SEQ ID NO:519

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 692 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...692

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:519

```
tacaggattg tcataattgt caatgagttc cctcatatat ccctgctctg tataaggctt     60
gccatataat aaccgacggg atgccctccg aagagcacag atcagccacg ggtttatact    120
ccccgtcttg ggaggtattc ggatcgaagc gatggacagg gagtcgattc gggctaaagt    180
attcggtgca ttggccactc ttctttatag gcttttacga actcgtcgcc gaagaattgc    240
atgatttgtc gtcgtttctt tttttgtcaa tcagatctgc tattccttcg ttctgaaaag    300
atcgaaagca ttcaaaaaag aatctccgga tgaaccttga taaccatttc gcgatagttg    360
tggaaaaact cgtgagtaaa taggtctaca agtcttcttc ttgcatcgaa agcgcgagat    420
tcaggtcaag gaaaatagca tatcgcgtac actggcatcg ggaatagtgg caatcagaaa    480
gaggtcgttc atagcggatt ggatgaccag gctcgttcgg gtaagtattt ttttgtcttt    540
catttgccct gtacaatagg gtgagaaaat ccgtatgcag aagaaaacgt cggcttcttc    600
tcgtttacgg gcgagccgac agatattttg tctgaggcaa gaaggcatat tcgttattgt    660
agcaggatgt tcaagatgct tgtccgttct gc                                  692
```

(2) INFORMATION FOR SEQ ID NO:520

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 688 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...688

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:520

```
tccttgccga tggttgttct ttcggcactt tctcagatta ctatcgtttc aaaagcaagg     60
```

```
ctgattcgct caaaaacgag gcatgacctg tgtgtctcgc gaacctcaag catatacntg      120
aaagaaactt gtggaaatct ctgtttgttg gcagccatac gcctgctctt tgatctttcc      180
tgaagataca aagaataact catacgagag gatactatgg tctcatatag aacgttttcg      240
atttgatgta cttctttcgt gagattgcca ttacatgctt gcagcgagga atctccgagg      300
gagattgcct gtggccgaac gcaggccatt gctgatctct cgcagaaaac acagtctgcg      360
aattggctga agatcataca caccggatgt tgcaccctgt gaagtgtttg ctatgtttgt      420
ctacttgaaa ctctgccaag aattcttaat caaggagcca ggcaacaagc gaacaactcg      480
ggcgaatggg ttatatttta tactcatcag agtttgtttt tgtgataggc caagggtaaa      540
ttatttgccc aggcgactct gataacaaac gaaggagagg caccgtgtag ttcctctcct      600
ttctattgcc aaaaactgac atttaggaca cgattgcttt gacagagtag atagtggctt      660
gagaaganaa aagaatgggt aaaatcgc                                        688
```

(2) INFORMATION FOR SEQ ID NO:521

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 1135 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...1135

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:521

```
gaactccgcc gcaaaacgat tcgactgact ttcgctgcac ctgccgtttg tcggtgcctt       60
atagctgttt ttcgtcattt caggtatgct gcctgctttc caatcagttt atttgatttc      120
ctttgcgtcc agtgaaagca gtaatgcgac tgaatggttt agcaggaacc ggtagatttc      180
tttatttctt tggtatgata tgaagatatg acacacagat cgttaaccga attcggcaat      240
ttctctttac cttgtttcat taaaaaacca aagatgagta tgaacatcta cgtaggaatc      300
tgaactatcg ggttcgcgaa gaagacctca caggtctgtt gcacagtatg gcgccgtaac      360
gagcgcaaga gtaatcacag acagagaaac cgccgctcac gcggattcgg cttcgtcgaa      420
atggaagacg agaatgatgc agccgtgcca tcgaagagct gttcgatcag gaattccaag      480
gtcgcaagct atcgtcaaag aggcattgga acgtcccgag cgtgctcctc gccgtacttc      540
cgacacgaag atcgctattg atccttctcc cacttccggc aagtcgtaca caacgccgat      600
acggctttcc ctctgagagg tcttcctcta ttattctacg acacgaatta caagacaggc      660
cgcaggcaca ccatcatacg gtgttccctg cggccttctt gcatctgctt gtaccatgac      720
agcccttgtc acaaacatcc caaccgcaac tatatacggc tctcaccgaa cattccaccc      780
ccccaacttg ccatccgcca cagagcagat agcatcttcc atcaatagac catgtatcct      840
ctcatgtgag accatagtat cctctcatat gagaccatag tacctctcat aggagaccat      900
agtatcctct cgtatgagac catagtatcc ttcatagtag accatagtat cctctcgtat      960
gagaccatag tatcctctcg atgagaccat agtatcctct cataggagac catagtatcc     1020
tctcgtatgg accatagtat cctctcatgt gagaccatag tattctctca taggagacat     1080
agtatcctct cgtatgagac catagtatcc tctcatgtga gaccatatat cctct          1135
```

(2) INFORMATION FOR SEQ ID NO:522

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 406 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

(iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
    (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...406

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:522

```
tacttctttc ttaatgagac tgataattcg ttgttgggtt gatgtatcct tttgaacgtg    60
atattgaaaa ggctctttgg actggcctgt cttatactga ttgttaattc ttctcctcgg   120
attcggtgtc tttgtgatcc gatgtgtcaa tatggcactg gtagcccccca tcgtaatcac   180
atcgccatcg ttcagttgca ccattctttt ttgtccagaa gacgtcctcc gacaaaagta   240
cctacagact atcgtcatcg gcaatcgaat aaagaaaaga tccgtctttt ttngggtcac   300
tcgaagtatg cagtggtgtc gtcccatgct tggatcaccg gtcatactgc aatgtccaca   360
accgagtctt tgttgcgacg tcctatcccg tttcctcctt tctctg                  406
```

(2) INFORMATION FOR SEQ ID NO:523

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 645 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...645

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:523

```
ttagaaacga agctgatgcc ccatcgggct gataaaanag ttnggcantg tcagaatcat    60
gtaggtcaat nccatcaacc aaggagaaac tttcgtaact cnacccctgc attacgctct   120
tcgaaagtag gcagtcccat tgacccgtag ccatcacgac gaaagcaagt gcagcgataa   180
acataccgat cacaatttct taggggtgga aggctccata ttacgtttct tcagaaaacc   240
gaagagaaga gcagaagtgg cgtaagagtt actacgaaga acgggttgat tgacggaaca   300
tttcagctcc cactattgaa gtgaaaccaa gatcgagttt tacctactta ggtcaatata   360
atccttagca aactgagtca gcgatactcc gtttggtgga aagacatcca gaagaaaata   420
acgacaccga aaactgcgca agagcaataa tgcgttggcg gatctcatcg gctgccatct   480
tgatttcttg ttttgatctt tatgagcctc agttacggca ttagcttttt gatcagcgga   540
tattgatgct tattgatgat ataaaatcag gaaagaaatt gccttaaaaa tacggctgca   600
aggaaatgca tagtggaatc ctggtgctga ataccttgat atatt                   645
```

(2) INFORMATION FOR SEQ ID NO:524

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 416 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

(iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
    (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...416

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:524

```
ggctcttctc gaacgtataa ataccggccg ctaccggcaa atattgctag cgggccttgc    60
ttcacggctt tggcagacag ctttcccggt ggtgcaacgg atttgctgac aatgctgtgc   120
tcgaagagta tttgaaagct cattccatca tgattccctc atcttgctca aaggatcgca   180
cggcatccac ctcgaaagat aattcctcta tgttgaagca aacccttgct caaaggcagc   240
aacaaatctc tctgtacaac agatccagca aatcaaactc ttggagcttc cggcattgag   300
ttagaagaga ggatacagaa agaactggag gccaaccctg cttggaagaa ggagcgtacg   360
atgaggaggt ggccggcagt gcggatggaa ccaagacaat cttatggggg acgaca       416
```

(2) INFORMATION FOR SEQ ID NO:525

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 797 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

  (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...797

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:525

```
agcttgggta tcctgcaatt tctgaaatct gtgcatctat cacactgtct ccagcttttc    60
gaagagcaat tcgggattgc ccaanacgtg tccttcggta agagatccgt actacccaaa   120
cgatcccagc cgaaaggaca gtcggtgaga gcatcgacat gagttttgcc gaggagaaag   180
gcaggaacgg ttcgaagcga tagccagatt ggccgttatc tgcagagaca gattgaggat   240
cgtagcacac ggttcatatc cgtttttgcc agcttccaag gttccgtatc ggccgatatt   300
tattgcctat acgtgccaga ttcatcgctt ctttcagtgc ttccggaagt ggaacgtatc   360
caactgatgc tccaaggcct gcttcacggc tgaaactcct ctatcgtgcg gctgtcgcaa   420
tccgtcagct cgcctttggg cggacagctc catcgaagta tttatgagta aggaccaatg   480
cccggttcac aaattgccga atatggctac cagttcattg ttgttgcgag cctgaaagtg   540
cgccacgtga agtcgttgtc cttcgtctca ggagcgttgg ccgtgagcca tagcgcagta   600
catcctgctt gcccgggaac tcttcgaggt attcatgagc cagacggncc agttccgact   660
ggtggaaatc ttatctcctt cgaggtgaga aactcgttgg caggcacatt gtcaggcagg   720
ataaacgaac cttcgcacgg agcatggccg ggaaaacgat ccagtggaat acgatattat   780
ccttccgata aatgaac                                                   797
```

(2) INFORMATION FOR SEQ ID NO:526

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 1398 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

(ii) MOLECULE TYPE: DNA (genomic)

(iii) HYPOTHETICAL: NO

(iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
    (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...1398

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:526

```
aggaagagga gggcgaggaa taatccactc aagccctatt ccctctatct cttctcttct    60
tacccgtaac ctctctaagc ggagtacttt gacgctgaat ggcggtgtgt cataatgcgc   120
aaattgccgg gttgcttgcg acattcgctt cagtcacata ctttaatcag cctcagcacc   180
ttgtacttta ggcattttac gtacctaaaa gggggctgtg ccaagaatga attttgacat   240
agcccgtcag actctcgggg gacaatgcac ttcgcttgcc ttttttctta tccatcaact   300
tttttcacga tggcaaagcc tgtggtagaa acgcctttga tgcccaatac tttcagatca   360
agcaaaaaca ccctgatgct atcctgctct tcgggtggga gatttctacg aaacattttc   420
ggaggatgcc atcgtggctt cgagatcctg gggataacgc tgacacggcg tgccaacgga   480
gctgcccagt tgtcgaattg gccggctttc ctcatcatgc gttggatacc tatctgccca   540
attggtacga gccggcaagc gcgtggccat atgcgaccaa ctggaagacc gaaaaagacc   600
aaaacgctgg tcaaacgcgg tattaccgaa ctggtcatcc cggcgtatcg accaacgaca   660
atgtactctc tcataaggag aacaattcct tgcagccgtc tcctgcggca aagaggtctt   720
cggtatttct cttctgacat atccaccggc gaatttatgg ccggacaagg caatgccgac   780
tatgggaaaa actcctgacc aactaccgcc cgaaggaaat cctcgtggaa cggcggagcg   840
gtctcgcttc aacgacctct tccactggag cggatttatc ttgatatgga agactgggct   900
ttctcctcgg agaacaatcg actacgcgta ccaagcactt tgacctgaaa agcctcaaag   960
gtttcgggct ggaagagctt cgatggcagt aacggcagcc ggagccgact tgaactatct  1020
cgatctgacc agcaccatca gctacaacac atcacatcgc tgagccgact ggatgaaacc  1080
ggtatgtacg cttggataag ttcaccgtcc gaagccttga attgcttgcc cgatgaacga  1140
gggaggcaag agtctgctcg acatcatcga ccatacataa cgcctatggg agcaaggcgt  1200
atacgacagt ggatcgtatt cccaccaagg accctgcacg catacaagcc cgacagcgag  1260
tggtggagtt tttctccgac atcctgaaga gcgagccatc attgccgaac atctgacaga  1320
gatggcgact tggaacgttt ggtgacgaaa ggcgccatgg gacgcatttc tngcgagaaa  1380
tggtncacta cgtgtcgc                                                1398
```

(2) INFORMATION FOR SEQ ID NO:527

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 686 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...686

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:527

```
caggggatcag gaggaggagg gctctaaccc gaatacgatc cggagaccat agacaatcca    60
caagactaaa caacgaaagg agtgcgtcga tccgaaagtc cggcgcactc tttgtataga   120
ttcagatttg actcataaac aatcaatagc ggacttcatt ctcttaaaat aagtatattc   180
gcaaaataaa taagctatta caagtaaaat caactttatc ttaggttaaa gctcaaggta   240
```

```
attgatatac tctgggttag gatgataact atttagttaa agaaaataag aaaaacttat    300
tcacgctaaa acatggcaaa aaaattcaaa atagaaccta ttacaaaagg catatgacac    360
tacacgaagc aatggagaaa ttactcagag agctggaaga ggtatgacaa aagataaaat    420
cgcagaaaaa ttaaataaaa aaagtggtat cagaaagaag actgttcaga aattagccca    480
aatcaaattt agcgagagca agcacatacc cagagatctt ccatcgcaaa ggcggaaaat    540
ttctctagtt aatagaaata gaacacaaca atcctcatca aaagaagttc aaaagctcct    600
aaaaatacaa agcagatcca cagaaaaaat ataccatagt tgaaaaagag ctgctagacc    660
aactaaaaat taaacttgnc aaagta                                         686
```

(2) INFORMATION FOR SEQ ID NO:528

   (i) SEQUENCE CHARACTERISTICS:
       (A) LENGTH: 4735 base pairs
       (B) TYPE: nucleic acid
       (C) STRANDEDNESS: double
       (D) TOPOLOGY: circular

   (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

   (iv) ANTI-SENSE: UNKNOWN

   (vi) ORIGINAL SOURCE:
       (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

   (ix) FEATURE:
       (A) NAME/KEY: misc_feature
       (B) LOCATION 1...4735

   (xi) SEQUENCE DESCRIPTION: SEQ ID NO:528

```
ggctttggac tttgcttatt cgcttcactc tgatttggga gaccattgct cggggccaaa     60
gtgaatcaca aactcgttcc gctcagttat gtgctcaaag cggtgatcag gtggaggtac    120
tttcgagcaa aagccagcaa ccgaccgaga gtggttgcgc tatgtgacta cggcacgagc    180
caaatcgaaa gtagatcttt tctccgacgc aaaagacggg agctgatcaa tcgtggggaa    240
gaacggtggt cagtgttata cggacatccg aatccatggt ctctgccgag ctttggatag    300
gatcgcagcc tatttcggtt tcctcaatcg cgaaacattc ttcacgccgt cggtacgggt    360
acggtatctc tgcccgaaag cttcaaaaaa ctcttcaggg agaacatagc ggtaactttc    420
tgatgagggc tatccgttcg gattgaaagc gggcaaaagc aacaaaacct cctctccatc    480
cggtaagccc cagagaaaga ggataagaaa gcttacaaca ccaaaaagac ttatatcctc    540
aagaggacga attctcccgt aactatcaga ttgccgaatg ctgcaaacga ttccgggcga    600
cgatgctttc ggatttatca acgacgataa tactgtgtcg tacacaagcg atcttgcccc    660
attgccatgc gtttgaaaag cagcttggca accgcatcct ctctaccgaa tggagcttgc    720
acagtcgtac ctcgtcgaag ctaagctcgc actcaagggc attgactcca ccggtatcct    780
caccctgtga cacaggttat ttcggaagat ttcaatgtcg gcatcaagca catcagctta    840
cggccaaaga tggcattttc gagggacaaa tccatctgct tggcacagct ccgacgacct    900
cctgaagatc tgtcatcagc ttcgtcagaa taatacatcc agtctgtcgg acgcatatca    960
taatggccaa gaggctctcc cttttgccgt gccggatttg tatgggggtt actctgcagt   1020
cgctttacga atctctgaca ggaaataacg tgcgacctgt gtatattgcg tttagcgtta   1080
gctaatcgtc ccttaaaagg acttttaagg gacgactact tatagcgtat tagcggggagg   1140
ttcttataga aatataatcc tcacttccta agcatttgca gaaagggtgc atcgaaaatt   1200
gatttcggtg cacccttgg tattgtcctt aggccaaagc ctatatgaaa cgattcttgc   1260
tgttttaggc cttattgcca acagtactgt tcatatggat tgaccctgat tcggattaag   1320
ctcaaccatt ccgggtacgc taccgaagat caggatggac acgagaagag ccagatagca   1380
taaagctcgg ggaaaacagc catcaccatg gtagcaccga aacgttgtga ccaccgccga   1440
tagcctgaat accattagcg catacctgtg ttggcggatg gcagacatca gacctactac   1500
acccagtgcc aaaccggcga gaaaatagcc caacctgcaa gcagagtaag agcattggca   1560
gcaaccaatt ggtgatcaag ccggatgcca taaagaagcc cacgaaacca tagagtcctg   1620
tgaactcgga agagcactaa gaccgatgta gagacccagt gaatcgggtt cttcttcatt   1680
gcgccaacgg tagtgttacc gcagatcgtt acgccatggc acttccgata ccggtcaatg   1740
caaccatcaa tgcaataccg agatagctaa catttgttcc ataatacttt tgtgttgttt   1800
agttgttatg attttttgaa ttgttctttt gtgatttagg agcgtttgaa cggtgtgtac   1860
tgttgccccc tccctcaaat tcgctgttct tatagaactc tacgaatgtc aacgaatggg   1920
gtgaacaagc gaactgatca tcgtaagacc gaagttcaga catgaccgat cagcaaaatg   1980
atcagcatca cgatgatccg aggtacaatc tcatagaagc agtcatatcc gtagccaacg   2040
tattgaatac gccaccgaga tagagcccgt gagtccgatc gcaaacagtc ggatatacga   2100
```

```
aagcgtacgc ccaaaagtcc tgatgctgtg ttataagccg tccacaagcc gctaccaaat   2160
tgataaacgg attcttgcca ggtgaattgt agaagaaggc taccaacctc cggcaactgc   2220
aatgccgaac atgacattga tcaccacttc cggtccttcg gtgctatcat gggtaaagcg   2280
aatgccaata tcactgccgt gatatgactg cccacgcaaa tgtggccagg ctatacttca   2340
ctcctcgctg gatttgatct tgataccggc caaaatcttg gcataaatga tctgtatcag   2400
acgataacaa cggacaaggt catcagattg tcctgattca ggaagtattt ttgacacttg   2460
ccaactgggg tacttcagcc aatgctatac cgaagaacga ccggtgagca gaccgattat   2520
cgtggtagct ccacccagcc attggaaaga gtgagtatcg gtttcagttc cttaccggct   2580
ttccctttga acagggtgaa gcaagcaaaa taagcaagcc gtagcctcca tctccgaagc   2640
aaagccaaag aagagcatga agaagggtgc caggaatggc gtgggatcca gctctcgtag   2700
ttaggcaaag aatacatctt cgtaataggt tcgaagagcc gcgcaagaaa ttgttcttca   2760
gcttgatcgg caccttgtcc ccttcttcta tctcatctgc tctacatagt agccttctcc   2820
ggccaatgcc tgctccatag tcaagcttct gacacgggta cccagccttc gagaagcatc   2880
agtttgtcat cgcttgtcct tcggcttgta ccatggcact ggtgaatgcg aatttgtccg   2940
caggaggttg tcataggccg tgagttcagc catacgattg tcggcaaata agttttgtcc   3000
ttcgcattcg cttccaatag agcttccagc tcttcctgtg gtgacggagc gtagccagat   3060
cgtaatcggg tagtttgatt cgctcggatc gggtctggca tcctgtttat gccctatggt   3120
gacgaaatga acagtgagcg tacggtattg atagccactg ctccgaactt ttcttcccac   3180
tcaggttgta agccgaagag gaagacgaat agaaattcac ttcatagccg gcttccggag   3240
tctttcgatg gatgcaaagt cgaactgccc ccaaacttcc atggctccac ctcccgcttt   3300
ttagacagga tcgcgccttt aagacgggtc tctcggcgaa aagagcctga gcatcctgca   3360
tggcagcttc tccgtcagct tggacgcaag tgtcagggtc tgttcggcgg gagcatcctc   3420
gcttttgtac aagcgagcat gcgcttggtc tgggcaatct ctttacgcaa attgaggagt   3480
cttgcaattc cgccacatct ttcgtagcct tggtttcccg gatgtgtaca ccccgatcgt   3540
acgcaacttt tccaagaaag cttcgtactc acggtgaaga tcaggaaaag gtatttgttc   3600
attgcggtaa tcatgccatc acctccctcc tttgttacgt ttctccatat tggctcgcat   3660
aatcttctga gaggattgga caaactctct tcatcctcca gatagcgttt gatcttgcgt   3720
atgggtcttt gtagccgggg atttgcactt tctcaaaaag attcactttc tgttagtctt   3780
cttgcgtgca tattcgagga actccaactt cagaccgagg aatcggcctc gattccggta   3840
tgggccaagt tcttcagcag gtcaatgcct tggcaaacca tgacggggca ttgaacaaac   3900
tgaaaggctt gatcgtgtaa aaatgtcatc gagtacggga acgactacgc ctgccacctt   3960
ctttgccgaa gcttgacacc ctccacactg atcaggtcgg gtttgaattc gttccacagc   4020
ttaccatgct tcggtagcct acgatctctt cttccagttg gcgttccatc gctccacctc   4080
gtccttcgtt cgcttcacct ccagacgcaa tgcgcttcct tgcttttgat cgtcggtaag   4140
gtacgctctc gcatcttaag ctgctttctt gctgctgaag tgaggttttg ttgtattgaa   4200
acttaatagc catttagcac aaggttatta tttcttccaa taagtgtcca caagctgctg   4260
cttatattca cttcggccgg tttgaagtgc ttggagaata gctcccacgc cggtcgagca   4320
tctctgtcgt attcacgttt acgtctatgg ccaagagctg agagagtagt cattggcgaa   4380
ttcgagcgca cggttgtcgt agtccgtaag tcgaaaccgt tctccatctt ggtttgagca   4440
ttggccgcat cggagaaaaa cgaaccgcgg cattcatcac ctgaggatgg tcttctcgag   4500
tcttcttacg ataacgagct gcttcaaacg agagaggctt cggaacgggt ctacgatacc   4560
ttacctacgt tgctgtcgcg acggagatag agctgacctt cggtaaataa ccggtgttgt   4620
ccggcacggc gtgagtaatg tctcctccgg aaagatggtc acagcgataa tcgtgataga   4680
accaccatcg gggaactgta cagcttttcg tagattttgg ccaaatccga atggg        4735
```

(2) INFORMATION FOR SEQ ID NO:529

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 369 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...369

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:529

```
gaaaaaattt tcgcgccacg tcttttccaa ccgtattccg gctttttctg aacgacaaaa        60
gagaaaaggt gtctatgtgc catcggtaac ttcggacagt ggcggatgcc tcatcgagta       120
ggccaaaaat gcctaccttt ggggcagtgt aaaaacttaa tatcaatatc taacaagagg       180
atacagcgat gaaattttta tcgacacagc taatttggat cagattcgcg aggcgaacga       240
catggtgtct tggacggcgt tactaccaat ccgtctctga tggcgaaaga gggtttagtg       300
ggaaagacaa ttgcatgagg cactacttgg ccatctgtga gatggtcgat ggagatgtga       360
gtgccgaag                                                               369
```

(2) INFORMATION FOR SEQ ID NO:530

    (i) SEQUENCE CHARACTERISTICS:
         (A) LENGTH: 1078 base pairs
         (B) TYPE: nucleic acid
         (C) STRANDEDNESS: double
         (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
          (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
          (A) NAME/KEY: misc_feature
          (B) LOCATION 1...1078

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:530

```
tggttttttca ggaattggat cgcttgccgg aaggattctc ctgtccggag ggcgcgagaa       60
accttgggga acgaatcacg ccgttctgat gggacgagtg cgattcgcga accttttgcc      120
gtcatcaatg cggatgattt ctatggagca atggttttga agttctggct cgtaagctca      180
tgactttgga gggtaacaag gcgaatactg catggtcggc taccgtgtgg gtaataccct      240
gagcgaagcg gtggcgtttc gcgtggagta tgccaggtag atgaaaaaca tttgttaccg      300
gtgtggtgga gcgtaccggc atcgagcgca cagacggtac tattcattcc gagatgagac      360
cggaaagata tgtacgctgg cagaggatgc accgtttcga tgaatatgtg gggattcact      420
cctgactact tcgactattc gaagaactgt tcatcaactt cctgaatgct catggcagg       480
agccgaagag gagttcttca ttcccttcgt tgtgaacgat cttattcgca gcggtcgagt      540
tcggtggaag tgctggatac gacagcccga tggttcggtg tcacttatcg gacgatcgcc      600
ccggtgtcgt agccaaacta cgcgaactaa cggaagcgga gaatacccaa cgaaattgtt      660
ttaatgccaa atatcacaaa caatgacaag acaatcaagt ttctttgcct tgcgccggca      720
gtaatcggcg cattgtgctg accggctgca atggcaataa gggtcagact aacgatactg      780
acagaagcgc gaaccggtac cggccatcga cctcagtgcc atggatacat ccgacgcccg      840
caggacgact tttatcgcta ctgcaacggc aattggatga aaacaatcct ctcaaacctg      900
cttatagtcg ctacggctca ttcgacatcc tcacgacagc accctcgagc gtgtacacct      960
gattgtggac aaccttgcag aggacagcat gaagtcggca ctaatgagta tcgnatagct     1020
acgctctatg ncaagctatg gatagcatca aacggaataa agacggagca gccctttg       1078
```

(2) INFORMATION FOR SEQ ID NO:531

    (i) SEQUENCE CHARACTERISTICS:
         (A) LENGTH: 545 base pairs
         (B) TYPE: nucleic acid
         (C) STRANDEDNESS: double
         (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:

(A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...545

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:531

```
taggacacta atgtttcaaa atggcattgt gggttgcagg atctatagtg gattttcata      60
atatgtacca aaatcaagat cttcagcact ctccacaacc cagggccacc ctgaggcacc     120
atgtagatgc tcactttctc aattttgctt ttcctgccca ctctcctaca taatggtagt     180
cagggttagc ttgatctgtc cgtcacccgc acgagcactt cccataggca tggacaatgt     240
catagcatat acgacttcgc cgcattgtcc ggatcgggcc cattgccctc tttatacaag     300
aagcaaagcc caatgagagc aatgctccga ccaaaaacat tttttttaact tcataagcca     360
aatgtttaaa aggattaata ttaaattgat tcaaaaacgt cgaaagaaag actataaaac     420
acaaaacgct caagactata aaccggataa acttaacgat gaatcctcgt tatcacatat     480
ccgaacccat atctctacaa ttctatactc ttgcacacta ttctgctgaa cttcacctga     540
                                                                    545
cagct
```

(2) INFORMATION FOR SEQ ID NO:532

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 302 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...302

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:532

```
ctgaaaagca ggagattaca tgttgaatgt aaatcggatg gcaactcctt ttcataaaag      60
aaattgtagc caccatagaa tactccgact tgcatcaggt accgatactc tctgaataac     120
ccatctccag atagggtttt ctcgatacat atcccaccgg gctttgaaat gtaaggcctc     180
gtcgttggtc tttaagaaac gaaaggcagg aaattgacca gcaggcgcga agctcggtag     240
ctggttgaag gataaggtgg ttggcggctg tagcccgata gggaggcagt gtctggaaag     300
ca                                                                  302
```

(2) INFORMATION FOR SEQ ID NO:533

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 464 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
      (A) NAME/KEY: misc_feature
      (B) LOCATION 1...464

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:533

```
ccgtaatggt agccaaaaca tcaccagcag caatactacc aatttgagtg tagctttaat    60
ttcatagctc tgggctttcg ttgaaaccat cgcacgtgta cagaacgctc caccgtaacc   120
ttggcctgat tcttaatccc tgcgatacat tggcctcgga tacagcagct tcgatagtca   180
aagcatcaga aggctgaaac aggtcatcat gattgtctca tcagtagtac cattcttttt   240
ggcaactttc cagccgccgt agcaggattt gggccatcgg ctaccgtacc taaacttgag   300
cctgagtaga cagttcgatt acctctttga atttagcatc aaatctgctg cattaacatt   360
tgccaaaagg gcttttgcct tgcctgcgat gtattgagca ccacatatac tttaaccgtc   420
ttgccgactg cagaattaac ctgatgcctt ttttgggttt caaa                    464
```

(2) INFORMATION FOR SEQ ID NO:534

    (i) SEQUENCE CHARACTERISTICS:
         (A) LENGTH: 928 base pairs
         (B) TYPE: nucleic acid
         (C) STRANDEDNESS: double
         (D) TOPOLOGY: circular

   (ii) MOLECULE TYPE: DNA (genomic)

  (iii) HYPOTHETICAL: NO

   (iv) ANTI-SENSE: UNKNOWN

   (vi) ORIGINAL SOURCE:
         (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

   (ix) FEATURE:
         (A) NAME/KEY: misc_feature
         (B) LOCATION 1...928

   (xi) SEQUENCE DESCRIPTION: SEQ ID NO:534

```
ctttcttctg atttgtggtt cgacttttcc tgatggatcg aacgcttctc ttcgtagggt    60
ccggggccat gcagagaaaa tggtacataa ctaacggact ttagcgacta taaaagtgct   120
tagaaagctg tttttgatgc gtcaacctgc aacaggcctc tgtcatctat ttggagcaaa   180
ttcataccct ttcgattcag tcggaaaagc aaaacgggaa aaaccgaaaa aaagaatcac   240
ttcgacgatc gctttttcat gctctgacaa gtaaaaacaa cttgcatgga gaaatatcct   300
tttgcgacat tttgtttgcc gcagagcagg caaacaggaa taatctcggg gtgccatcct   360
tttgatgttg aaatgcgatt tgcgaagaag cctcgccgca ttctttctct cgcggacagg   420
catggaatcc aaatattttg ggcggaatgt cttgtgaatg aaaaaaatat cggaactttg   480
cggccgttgc attggtcttt atcacctgaa aattatttga tagggctcgt cgcattctgt   540
aaaatccacc ttatcaaact cagtatgcta tgacggaaaa aactaccgaa aaacgctgaa   600
agatgttgta gtccgattct gcggcgactc cggagatgga tgcagctgac cggaacgata   660
ttctccgacc tttcggcggt gtttggaaca ccatttccac tttcccggac tatccggcag   720
aaattcgtgc tccacaggga cattgggcgg agtatccgga tttcaagtgc acatcggaac   780
ncgactggta cgtactcccg gcgatttggc tgacgttctc gtagccatga acctgccgtc   840
tcaaagttaa ccggacacac gtaagacggg actncattat tatantcgac tctgactctt   900
tatggcatct gatttggaga aagcagaa                                       928
```

(2) INFORMATION FOR SEQ ID NO:535

    (i) SEQUENCE CHARACTERISTICS:
         (A) LENGTH: 236 base pairs
         (B) TYPE: nucleic acid
         (C) STRANDEDNESS: double
         (D) TOPOLOGY: circular

   (ii) MOLECULE TYPE: DNA (genomic)

  (iii) HYPOTHETICAL: NO

(iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
    (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...236

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:535

```
ccctctttaa aactcgttgg aatgccctcg actctagagg atcccccgc tttcccttga     60
ttgtgacgtg tactgagaaa agtcgtatgt tgtttttgtg ccgaaagacg gagaattacc    120
gagcctaaaa tctcaaaaac tcgaacccaa ggaaaatctt tacgcgcgag attttttgc    180
ttttggctcg agttttttttt tttctcgaac catctttttt cgatccgcaa ttgtgc       236
```

(2) INFORMATION FOR SEQ ID NO:536

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 285 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...285

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:536

```
ccagctattc tgtgcatcgg gccaaccgag atgatccctt tttgatctgt atctgcggag     60
gtccggcttt aacggttagc catgttcggc atttccgcat agccatgcag caggtacacc    120
acgcggcaat ctccgccctc gctcgccagg ctatatccgg aagcactacg agtacaggga    180
tctccttatt catcgagcgc ttggcaccga cagtctttcc actccggcag caaatccctg    240
aacgacgata ccgatagcag tatgatgatc tgtagtattc tcttc                     285
```

(2) INFORMATION FOR SEQ ID NO:537

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 798 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...798

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:537

```
caaaacgcca ttgccnatag taccacctnc atattcgntt gctgtcatgc tgtccaaaca    60
ttgngggcat cttcatcctt tcccgttaca ataaaatcca atgcgagaca tcgaagtcat   120
aaggcaccaa agaccccaaa gaccctactt ttggtaagta gcaccaccgt ctttggaacc   180
gatacagcct gacatctcaa aataaatacg agagaaatcc aacatcacat agatccatcc   240
attgttgcca cagccatctt gtaataaaaa tcctctgaat atcctgatag ggtgacatcg   300
tctcgatcaa tacatcgtct ccaccaatat ccatctgggc cttgccagag ggctaaataa   360
aactatggca aaagtcgcca gcagcagtct gatgcaattt ttaatttcat aattcttggc   420
atttttatga gtgaaacatt tttgttcata tcaccaaaat acttacctgg cataaacgag   480
cgactcacaa aatcggctcg ggaacggcta ctccagcttc gtgagcagcg tactgcctag   540
agcttgccct tcttgtcgta gctctcactc ttgacgcatc cgacatcctg gacatccatt   600
ccacggcact catctgtacc gtaatcatac tttccatacg atcgaatagc tgatcttgta   660
gcattcgaaa gtcccggccg gagtggaatc ctctcgatgc cctgcacctt gcgtccgatg   720
gttcgcagag taatcggggc aacgggaaat cggccgcttc ggccgtaatc gtcacttctg   780
catcggcagg gactgacc                                                 798
```

(2) INFORMATION FOR SEQ ID NO:538

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 826 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...826

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:538

```
gaatttaatg tgctatatca tgggctaggc ggcaatctgt ttctcctgct agcctccgac    60
acctgtacca tcgtgaagat gtcgtttcga tcgacagctt attcaggctt gcttacgtga   120
gtcacttgca gaatatccaa aagtcgacat gatcggcaaa gacttgtctc atcatcggtt   180
gaggcacgaa tggtgcagtt cctccggctt atctcgtctc ggaatacgca naaggactcc   240
atccaataag gctccaagcc gaacagtccg atatagccgg tcgatggggc aaggtaccat   300
aataataatc ggggtagcca tccaaatcat aatagcgaga ataggcatgc ctttcgtctc   360
cagcaaatcg gctttgtcct catagcccat cggcggaaca tggccgccac ctcttcggtg   420
cgctcacaat gtgctcggaa agtatgtctg cgactataag cgactccatt cgctccttga   480
tccgcacgat tctccgggtg tgatcatatg agcattcttg atctgacaat agtaaccgtg   540
gacaatgaat gttcgatgaa aagtttgctc ccgggcaata tgtctgcaca gccttgctta   600
atatgaagct gagcgttcgg acgtaagttc gcataccgat tcgtccgaaa aagaagcgaa   660
caggacatcg gatggctcat ataatcgaaa ccaagatctc gtgtacaatg attgacttgt   720
gcattgaaag gacgaagccc aaatcgtctt gaaagtactc tgccactcgc tctaaagata   780
tgcctgtgga aactcttcgt agcgatcgag attgtcacag tagatg                  826
```

(2) INFORMATION FOR SEQ ID NO:539

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 522 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

(iii) HYPOTHETICAL: NO

(iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
    (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...522

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:539

```
agaggatccc ctcctctcca ctcctgcaaa tctataaggc acccgctcgt tcggccacga    60
atcgagcggg tgtctctttt atatcagctc tccaaacacc ttttctgttc tactatttat   120
atacaaatcg aatacgatct atatacaatg gaaaatgatt tatatataaa tcgaaaacga   180
tctgtatata aattgaactg attaatatat acatcgccat cgaaactctt tcaaagcaga   240
cctcactccc aaaagtccga ttcatgaaca ttttttacctt gaaaacctct tccttcaatc   300
gcttatttag aatgattcca aactcttctt cgttgttgaa aactttctgg tctgtatttt   360
cgtgaaatat tttcagatgg gatggtgatt gttccggcat tatcgaatca aaaaaacgaa   420
gtactgcttc cggactacat aagctaacag actgcaaatg tcgaagatca gactgtaggc   480
attccgctct aatcgggtaa aaagctttgc ttcagtgagt aa                       522
```

(2) INFORMATION FOR SEQ ID NO:540

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 854 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...854

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:540

```
ccattgaaag gcaatccgag atttttgagt gtaaagtcgg gcaatactcg ttgtgtgcca    60
tatccagcgt ataggtagaa gtttgattat ggcccactcg aataaggggt gcgtatactc   120
tgtcggtgtt tttactgaca cgcttccatc ttttccatt catccttttg gttgttgatg    180
gaaaatctat accacatgta tagtcgcctt ccgagagagt gagaacgtct ttagaccaaa   240
ccaccgatag ttgctgctac cgcccggaac ttcagccatt acccagccca aagaattaca   300
tcgtccgcag tagctcctgt agatagagca aaggctacgg gtgacggatc tcatcagggc   360
tgtcgctatt gaactgtact gtaatcgtac tagttcataa gaattcagat ctgcgacaaa   420
gctgttgggg acgatactga gttgccttcg ttattatcta ccgtgactac gacattgttc   480
gggtctgtcg atttacttta atgctattga catatcctcc ctgtgcatgc cgtaccggcc   540
ccactgttcg gtgcctgtgc gacgataaag tagggtgatg gtgttgatcc ttgtgacaac   600
tgattaggtg ccaatgagaa actctcggga tgctctcgta tccgtaccaa gagatattga   660
tagatgaaag ttttcacctc tatgactctc cgtcagcctt ggttcaatct gtatccgagg   720
tcaagatttg attgccttca cctgtattat atatcgaata ccctacgttc aatccggatt   780
cactttatac tcggcttcta tgctttcagt gccaagatcg gcaaggcatc tgtccggctt   840
cagcgggagt ctag                                                      854
```

(2) INFORMATION FOR SEQ ID NO:541

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 516 base pairs

```
ttcgtcctga tcgagaagaa agccggagtc tcactgtagc cagtggcgtc aataaggaca      960
ggactgctct gcgcatcgtt gcgatcatct caagcaatat gatccggagg tgaaaatctt     1020
tatgctcaaa gactggacaa agattctgcc ggaatggtgc tctttgccaa gaataaaggg     1080
tacaggggtt tgtggtggac aagtggtcca aggtcgtatt ggaacaggtt tcgtgatggc     1140
gatcgaagga gagatgcccg atgccgaggg tacgctgatc ctcctcggta tcaaacctcg     1200
atcaagggca agcagtctcg tatcgggctg agactccttc cgttcattcg gtgggaacgg     1260
ctcgttacaa gggtttcgtc gcgg                                            1284
```

(2) INFORMATION FOR SEQ ID NO:543

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 696 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...696

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:543

```
tgccacagca aagttcgtcg ttatactgat agaggggata ttggcactgt ggtagccgct      60
gttgtaaacc aaatagccta tacgatagag gtactcctta ccccgctgtc ttggaagcat     120
cgtactatgc gccttatatc tggcagaatc agcaggctat gggtggtttt catccggatt     180
cttggatctc tactggcggg ggccgtcatt ctgttcaatg tactgtcagc aggtatttac     240
ttcgcgttag tgtccgaaaa ctcaccatgg ctaccgtggc tttcctcctg actagggagg     300
tgaaacgatt ttgttcggca tactgacatc caatctgaac ctgacggaga agatcttttc     360
actgctcttt tcttcggcag tatcggcttg tgctattcgt tttatccttt atcaaccttc     420
aaagacgaca actgaaatga cgctatactt caagcacaat ccatattcct gcaaatatcg     480
gacacgatca ggacaggatt ctctccggcg aatattcggc cgacgaaagg gtaccatctt     540
ccgcgaattg gccgaacaga tgggaggtca atcctaacac agcgatgcag ctgtcgaacg     600
cttgcaaatg gaaggtatga tctataacaa gcgcggatcg gctactttgt cagccccaac     660
gctcgcgaag agatccttgc ctctcgcgca agaatt                               696
```

(2) INFORMATION FOR SEQ ID NO:544

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 489 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...489

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:544

```
acgctgattt tggttgtcgc tctgctttat gccaagagca aattggtgct tccggcaatg        60
tgacgatcac cgtgaacgac gaacgcaaga tggaagtact cttggcggta ccttgttgaa       120
tacgcttcaa aatcagggag tattccttct tcggcttgcg gcggtggcgg aagctgcggt       180
cagtgtcgtt gccgtgagtg gaaggaggtg gcgaaatcct tccgacggag aagggatttt       240
tctctgcaaa gaacaaaagg atcattggcg actttcatgt cagacaaaag taaagaggat       300
cttagcatcg ttattcccga agaggtattc ggtgtgaaag aatggagtgt gaagttctct       360
ccaataagaa tgtctccact ttcatcaaag aattgtggtg aagctgcccg aaggcgagac       420
tatgaacttc aagagcggta gtatgcccag atcaagatac cgaatacaac atccgctatt       480
gccgaacta                                                               489
```

(2) INFORMATION FOR SEQ ID NO:545

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 413 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...413   :

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:545

```
ggatctcctc ggcggataaa atctttccgg tagccgaaga atcggctgcg attcagtctc        60
tacttccgac gtagcgatcg aggaagagtc caccggcaga atacggaccg gcgaatggag       120
gtatcctggt tttgtgcttg caatgacgca acgagccgat cgacagaaaa aggatcaggg       180
gtaaaaccgc aatatgcgta gtacaggcgt tctcatcttt tcaaggtttt agtgctgtca       240
atctgtcgat tatgctgcaa acacgttcgt acacggagtc catcgccgca tgctattgct       300
ctcaggagca tatcgggcaa aatttcgcaa ggtctcgatc agtgcataaa gctcccttcg       360
ataagaagtt ttcaggcacc atgaacccgg ctgaagcaaa gttcgttccg ggc             413
```

(2) INFORMATION FOR SEQ ID NO:546

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 898 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...898

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:546   •

```
aatacgtatc tgctcacgat ggtcaggtat gtccggccaa gtggcgtgag gtcagcagac        60
```

```
actgaaaccg agcattgatc tcgttggtaa gatctaagag taaaccgagg agagagggtg   120
tgtcggaatc gcaaaatgag gcgatcaaac acaccctctt tctttaaggc acgaaagagt   180
tctccatgct gtttctcgaa tacagtgaga taatcggaac tcttgattaa ggtccttttt   240
aatcatatcc taacgactat gcttgataaa gatactcttg cccaagtggg ttctactttg   300
cccaactgaa aaagtcctat acattacgac tcaatgctca tactctcatc cttcctacaa   360
cgaggcgaag gaaatgctcg atgggcttgc atcgtttcgg atcatgttcg tgcggaatac   420
aatgcggcag atgattttcg ttcgatctgc tcgtagacgg agcggatagc gggatcggct   480
tccgtggtat ccgggtggcc atgaatttag ctcactgctt cttgctattc tcaacaatgc   540
ggtatcggaa ggaatatccc cgatgaagga gtacaggata gaatccgcgt atcaatgggc   600
cgatagagct gaaaacctat gtatccctct cttgtacaat tgtcccgatg tggtgcagac   660
cctcaatatg attgccattc tcaatcgact atcaatcaca ccatggtcga tggttctttc   720
ttcccggacg aagtgagtcg ttgggcatcg cttccgttcc gacggttatg gccggagatg   780
aagtatccat gtggggccgt ggcgatatgg ctgccttgct gaacaagata gaaccaaata   840
tggctctgtc cctgccgagt cggcagataa gacgctgcgg ccttcgacct ccttgtcg     898
```

(2) INFORMATION FOR SEQ ID NO:547

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 672 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...672

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:547

```
cgtattgggc gatctggctt tgatcggaaa atatattcgc ggacgcattt bgccacctgt   60
ccggggcaca gcatcaacaa caagatggcg cgcctgatcg caaagaaatc aaacagaacg   120
aagcacaggc ccctgtctac aatccgacaa agagccgatc atggacatca atcggatcaa   180
agagcttcta ccccacgcta tccgttccta ttggtcgata agatcatcga agtagggccg   240
gactaatagt cggagtaaag agcgtttccg gcaacgaacc attttttcccc ggtccttccc   300
tggtgagcct gtgatgccgg gagtcctgca agtagaggca atgcgcaggt gggagggctc   360
ttggtactca ataccctgac cgagccttcg agtactccac atacttcctt atgatcgaca   420
aagtgaaatt ccgccgtaaa gggtacccgg cgacactttg gtgttcaagc tcagaatgat   480
ttccgagata gcagaggagt cgctaatatg cgcggcttag ctttcgtagg agagcagttg   540
cctgtgaagc tgaatttatg gcacagataa tccagaataa agaatgattc agagacaaaa   600
atcagtccgt tggcatgggt ggatccgcat gccgaagtag gaagtaggtg ttgagatagg   660
tcccattgcc gt                                                       672
```

(2) INFORMATION FOR SEQ ID NO:548

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 362 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:

(A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...362

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:548

```
catatatata cagagtcccg ttcatcgccg tgcgtattat cagcgatatg ccggcgaagg      60
tcgggataac tttgcggagt atatggactt ctggcgcagg cttctccggc tacctttct     120
attctcgaaa gagtattcga tgcaatgaga aataagacaa tcccgatatg gagatggaaa     180
aaattcccag ttttcattag atcatattcg cctcaaacga ggcatatatg tctcccgcaa     240
ggacttatag ggggagaggt ggttacgact ttcgatattc gaatgaaaga gcccatcgcg     300
aaccggtgct tggggcaccc gaacttgcat acgatcgagc atttggctgc aaacttatct     360
gc                                                                    362
```

(2) INFORMATION FOR SEQ ID NO:549

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 393 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...393

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:549

```
agcagaacgg cggcaggaga gccgagccgc cttttcgccg gctctctcgt gcactgggag      60
ccggggdcgg catggaagct gaatgtctcc gtccgccagg tcattctttt ggcggtttgg     120
agggatttcg ctccggctat acgcgcagga ctaccgcacc tacctgcttc cttcgggctt     180
catgagcgag aggcgaattc gggggcaaac ttttcggtcg actatggcga cgtgctgcac     240
ctgtttattt tcatctgaaa gccggatatt cgcgcagtcg ctccaacgaa ttgcccactt     300
cgactcacgg cggaacataa tatcatcccg ttacgagcgc tatggcaccg atcttaacgc     360
ttttttcgc ccgatatgcg tctgagcaag ttt                                   393
```

(2) INFORMATION FOR SEQ ID NO:550

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 263 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature

(B) LOCATION 1...263

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:550

```
ggatctcttg ataaattggc aattccaatt tatcaagaga tcccctcttt tttgcgtgag      60
agatacttca tcacagatgg atttgcttat ttgctcactc tataattcaa cccaacctgt     120
ttttcattgg gtttgtcgct caaaaaggaa tagatcccct cgtaaaatag ttggcgtgta     180
ctgaatgaaa aacataagag accattgcac aataaccctt ccatctcctc atatngatca     240
aaacaacaca tgcattgatt cgg                                            263
```

(2) INFORMATION FOR SEQ ID NO:551

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 599 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...599

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:551

```
tagaggttcc ccggccaact catcggcttg tgcgtggacg acgctaacga tccgaccaga      60
ccgaagctcg tatggagcgt tggatcgctg ccatgggctg taattaatgt tctctaagag     120
ccggagatcg agatcagagg gaaactgtta gcgcgaaata aaagcgtatt tgtcatcaaa     180
gcttactcct cttctcgcct tcggctctct cgttaccact cttttcctct tccccttctt     240
tccgtattta ttcgactcct gacgatggac acgcaaacac tcaatagcga tctggcgtat     300
tcatgcacca tatatacgag tttgaaaaag gtgtgcgaag catgtactcg ctacactggc     360
taacgacgac atcccatatg cggaagaacg gcgcgaagcc ggcagatccc ctatttcgcc     420
cagcctactc cgaatacgga ggtaccaatc tcttttcgg ctgcaaggag tgtatgggag      480
gctatccgtc tttcgtgagt ggacgcttct ctgaacaagc ctgacttccg gaggaagaat     540
catcatcggg gctatgctcg gatacgatat ttgcagacag tgcgaacgta ttggtcgcc      599
```

(2) INFORMATION FOR SEQ ID NO:552

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 664 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...664

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:552

```
tcccccagct tccaatgtac gaggttccag cccttcgggc agaacgatcg ttgtttgttc        60
tcttgagcac gtctgataac gtcttgaatg agatccatga taataccttta tagttattat       120
agttattgta atgatgatct tgaaaagaag gcgagcagaa ataacgcctt gtttgcagtc        180
gcaaagatag ttaaaacacg ggcaataaga gagatacatt caaaatactt tggaaatgga        240
agtatgcttt ggcagggctg tacttccatt ctccccattg cattaatatc ctttttgctg        300
ttctatctag tacgtgacga aagaggatga cgcaacccct ctacgacttc agatagactt        360
cggctgcacc gattctcagc tccatcctga taggacaggt attctattgg catcattcgt        420
gagccatatg gtaatagcct tttgggattc ttgaatgttt cggattcgtt tatgagcatg        480
gatacccgat agtatgatag ttgataccct ttttcgtttt ttgtacttca gaactttcga        540
ttgaaagaaa cagtcgatcc ccttttttccc tgcaaatatt cttaccggat gcgctctttt       600
gtactctttg accagtcttg tcgagcgaag atagagttgg ctcctatcat atccagagat        660
attt                                                                     664
```

(2) INFORMATION FOR SEQ ID NO:553

      (i) SEQUENCE CHARACTERISTICS:
          (A) LENGTH: 1446 base pairs
          (B) TYPE: nucleic acid
          (C) STRANDEDNESS: double
          (D) TOPOLOGY: circular

      (ii) MOLECULE TYPE: DNA (genomic)

      (iii) HYPOTHETICAL: NO

      (iv) ANTI-SENSE: UNKNOWN

      (vi) ORIGINAL SOURCE:
          (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

      (ix) FEATURE:
          (A) NAME/KEY: misc_feature
          (B) LOCATION 1...1446

      (xi) SEQUENCE DESCRIPTION: SEQ ID NO:553

```
ccgtcactga tgatgctgat ctgctctatc tgtccagcag gttgtttgca gattgtcttc        60
ccgtacttcc ttacgagcac atggttgcga ctgataccat gaaagctcct ggctcggtaa        120
ctaccaaatc gaatatctct cccctctttg caattgtctt ttttgctgct aacgcaggat        180
ttcgctctct ttcttttcgg gaaattgtct gcacttgaga ccactgtctg ccgcatagcc        240
tctcgagagt ctgtttggcc gtttccgaag agagaaagcc cagccgtaga agatgtcctt       300
ggcgcttttc cgagcctcgg aggtcggtaa tgatgcgatg tgatggcata gacagtggcg       360
gcaacttcgt caatagcctc tatgtccacc tttcgagcag tttgcggtag tactgctcca       420
tgccatggat tgtctccgag aagctgagaa gttttcggtg tcgcgatgga gcgcgagtgt        480
gatcttgcgt tgagtccctc tttcttgtcc cggctcatgc tccttgaacc atctgcacaa        540
acgtaatacc gaggaaactg aaagagcttt ttatgctcga taccacaagt ccctattcag        600
cttcagccct ttgcggtatt tcaaatgttc gctcaggctt ggagagcatt tagcggatct        660
actttctccg gcaagaagag tagcagtcgt cggcatagcg gataaattcg gttgttatat        720
gcccggcgat gtagcatccg tgtcttccaa gtagaggttg gaaagcagag gggccagagg        780
gcttcctgtg ggatgccgga ggatgcacga gcatattgct gcttccggtc cacactccgg        840
acttcatcca gaggctcaac atacgggtaa ggaagggatc ttggttgttc tttggacttt        900
ctgcaataga gaggggacag ggatagaatc gagaagttgt caatatcgca gcgcaccact        960
gtatggttct catccagaga tccagcagat gctgcactct acgaacggca gccacagctc       1020
ccttcccctg cgataggcat agctctgtgc aatggataaa gactcggtga tcggataggt       1080
atgccggcaa ggcttctctg caagtggaga tccactgccg aagggattgt agctgtcggt       1140
aagagccatc ccccttgggt atgttcacag agtgatgggc tgcggtatat agctgcaaat       1200
acgtagggct tccaacaaat cttgtgctcc gcttctgcca tgggaaggtc acgatccgca       1260
gccagcgaag agagcacttg cgatacaagg tatcgttgcc cgagtgctct ctatctgacc       1320
attcccacga ttgtatgatt gcctatatgc acccaatgcg ccattgagag caaaggctgc       1380
ttacggatcg tagggaacac gatagaagag ctgacccaat agccgacatg tcgtactgct       1440
gtttcc                                                                   1446
```

(2) INFORMATION FOR SEQ ID NO:554

      (i) SEQUENCE CHARACTERISTICS:

```
        (A) LENGTH: 620 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

   (ii) MOLECULE TYPE: DNA (genomic)

  (iii) HYPOTHETICAL: NO

   (iv) ANTI-SENSE: UNKNOWN

   (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

   (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...620

   (xi) SEQUENCE DESCRIPTION: SEQ ID NO:554
```

```
cggccgaagc ttttcgatcg gtatcagtcg gatgtccttg cacacgtcca tcggatcgcg      60
tacgggctcc gtcccgagca gatagagtat ttcagctagg tagcaccttc gctttcgatg     120
aagctactac tccatagcgt aaagctgctt tcgtaggaag ttcgccattg tgacggcgag     180
cgtagtcggc cagcattcct ctgccatctt cttccctttt tcccatgcag ctgctgatgg     240
tgtggctcgg cattgataga gaagaggttt cttccggtag gaagcgtctc cggatggcga     300
tatagtcgcc acccggcgaa ggtgccgtat aaccgccgga gaggcgttca tcatagaggt     360
cagctccagc tgtgggctgt ttttgagtgc ctatagtaga aaggtatctg ggcaatagca     420
tgcttgagtt cgctgatgct cctgccatgg ctttgtcttt ggaggtaagc tctcgtactg     480
gctgattcgt atggccggtt gcttggcttt cgacttatca ggcatcatag cttttgcctt     540
tccgaatgtg ccgcttgcat agaatccttg ccgtgagaag gcgttgcggc tctgctccat     600
cactcttcat cttggcggcc                                                 620
```

(2) INFORMATION FOR SEQ ID NO:555

```
    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 354 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

   (ii) MOLECULE TYPE: DNA (genomic)

  (iii) HYPOTHETICAL: NO

   (iv) ANTI-SENSE: UNKNOWN

   (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

   (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...354

   (xi) SEQUENCE DESCRIPTION: SEQ ID NO:555
```

```
ggcgaagctc ccgacgttcg ccgcaagttc gtcgcggcag gcgtggcact atccttgctg      60
tgagcggttt tcacgtgggt atcgtattgg ctgccctcgt tttctcatgc gtattctgcc     120
gataccgcag cgatggcgtc gggcagatgg ctgcttccgc ttgcaggggg atggatatac     180
gcattcgttt gcggttgggt gctcctgtag tccgagccat gctgatggct accttatata     240
tagtcgtaaa tgctcgggca gaccgtacgg atggattgaa tgtttgggct gcggagcgtc     300
cattacactc gtggatcgat cccctctctt ttttatgacg tgggatttgg tggc          354
```

(2) INFORMATION FOR SEQ ID NO:556

```
    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 524 base pairs
```

```
            (B) TYPE: nucleic acid
            (C) STRANDEDNESS: double
            (D) TOPOLOGY: circular

      (ii) MOLECULE TYPE: DNA (genomic)

     (iii) HYPOTHETICAL: NO

      (iv) ANTI-SENSE: UNKNOWN

      (vi) ORIGINAL SOURCE:
            (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

      (ix) FEATURE:
            (A) NAME/KEY: misc_feature
            (B) LOCATION 1...524

       (xi) SEQUENCE DESCRIPTION: SEQ ID NO:556
```

```
ccgacaaaac tcacggaaat gttcttctgc gtaaaataag aggttacgga cggtactccc     60
gaacttcgtc ataaatccgg ttgatcagct ccattcgtct ttgtcgttca tcgacagggc    120
attgtttttg agaagcgttt tcagctcttg agcgactcac cgctcatttc aagcagtttg    180
gcatagcccg atgccaagcc gaaagttctt ccggactgta gttcggatct ttgagcatgg    240
agcgaacccc gtgacgtaaa tatccgtgat atcgcctacc atcaggatga tctctttacc    300
ttgtaggcat ccccgatcag gttattgacc cgtcttgagc gcgcgtaagt attttttccc    360
ctgatgatag actttctcca cttccttgaa gtgttcaggg tgttttttac cgtcttggaa    420
gccgttgcga tctccttgac ctgttggcga tgttgccggc aaaatttggt cggatcggtc    480
acgacccact ggcattgtac gctgccacag cagaccggca gtac                     524
```

```
(2) INFORMATION FOR SEQ ID NO:557

      (i) SEQUENCE CHARACTERISTICS:
            (A) LENGTH: 3287 base pairs
            (B) TYPE: nucleic acid
            (C) STRANDEDNESS: double
            (D) TOPOLOGY: circular

      (ii) MOLECULE TYPE: DNA (genomic)

     (iii) HYPOTHETICAL: NO

      (iv) ANTI-SENSE: UNKNOWN

      (vi) ORIGINAL SOURCE:
            (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

      (ix) FEATURE:
            (A) NAME/KEY: misc_feature
            (B) LOCATION 1...3287

       (xi) SEQUENCE DESCRIPTION: SEQ ID NO:557
```

```
ttcatttcga gtggtataag caaacgattg acctgacgtc agacccggct tgacatttat     60
cttaatcttg tcttcaccgt tcgcgagtca aagtgactct tccgttccgg caggtgaggc    120
attgactcct cccggatgcg tattgtcgga gcataagaac ccgtcacata cttaaagccc    180
aacggcagcg tgatttcaaa tatgccttgg gggtagtttc tccacctacg accgtttgca    240
ccactttact cttttgggag ctttacagtc cgattgtgat gttgtggtcg taacagctgc    300
gtagaagcag aagtcgtgta gggctctata gctccattta ttcaattgga ggcgtactta    360
tggcaagacc cgatcccttg gcattctgat taaagcatta cggccgtcag ctcttacacg    420
gaagttcttg ccagatacga agaacactcg gtctttatgt agaacttcac caaaatttta    480
cgttgattgt gttggattcc ccctctttca ggcccttgag atagcctatg gtagtcaatc    540
aggatgctgc aacagattga cggaattatt gaccacattg agtgcagcca attaccggaa    600
ccggcaggat attccacctg tacctgattc ggtgtcacac caatccctct tcggggaaga    660
tgctgaaagt aggactataa acgttccatt atctgtcgat tgaatgctgt aaatatattc    720
caatgtacta cacaagtagc agcagctgta ggatctggaa cagctatctc agtaagctcc    780
atggagctgg cagtggcttg agcttgagat cgatcacctg cgaactgcaa acaactcatc    840
caaactaagg ggatatgcac tacagttcca gcccccatc gcttcaaagc gataggagag    900
```

```
caaccagaat aggtaaagtg aatggtatag taagcgcaga acctactgga acaccagctt      960
ccgacaaacg atacatcttg caccagaata agttgtaaac gccatttcag tacctgccgc     1020
atcagttact tttcgatggt cagccccgat gttgtaggca atgccaacca aacataggag     1080
ccgttgcact cgatgggttg ctgatacgca gcttccactc tcccgtttac ccacaagctc     1140
tacctcacct gactgattga cgagcgcaat agaaggttgt tagtataaag gataggcctg     1200
ttgtaaacat tgagggcgga aacacgtaga ttccgttgct gccagccgat tgatcggcta     1260
ctatgtcaag gctataggta ctgttggctg cgttgctgca taatagtaat agtcaatgta     1320
atcacatagt atgaaatttt atcataatta gttgctacag cagacgacgc acagtgggag     1380
atacatttac tttaagagct gctccatagg cattttttac ttaatattga agtgcgcctt     1440
ttcgttgtct gcaagttgat acttatagat ttatattcac cctgtgaagt cacatctgta     1500
tgatttatttt cctcgaaagc atggttgtac ctaacgaact atggttacgg tgattgctat     1560
actccaccta ttcagcgtgt aggacttcgg tactttcaga tagatatttc taatcttaca     1620
ccaggacgat attcattggc atattcaaat gcaccagagc cgaaacacgg gcgtagtggt     1680
tagcaacgcg tcccagatct gttggagtac attgtaaatg acatgtggat cggtaccgtt     1740
tacaacaaaa gtacccatga tgtaatctcg ggcacaagta tgagacaagt taacggattg     1800
gcttcatccc atacggtgac acattggcgg tagagttgta gaagaaccac tccctaccga     1860
ctgcgtatct actctatgag cattctggga tgttacccga taacgggtaa cacatccact     1920
ttgtctctat caagcaatcc accagcagga aggattgaag aaaatcccag tcgatcacct     1980
gctctgcatt attatttcgg cgtattgaag gaatgtcgta tatccatcta ccgatacaat     2040
ctgaacccca tcacggaaat cttaatatcg gccgaaagag gagtaagcgt ttctactcga     2100
tcgacaccgt agccaaaaca aaacgggcgc ccaaagacga agcagtacca tgctggtaga     2160
agtcgctgta atgttgactt cgtccatata tagggcttta gccaatcgta agccgatata     2220
ttgctacgag attgacgggt ccgcatcgta taatcgtcca gcccaacgaa ttgtcggcac     2280
gttctatctt aggcaccgaa gttccgcacc tctaccgcag ggaggatcgc agcccaaaac     2340
ataacgcttt gcgtgttaca cataatagga cctaccgggc aaagacaatc agggaagtga     2400
agtagttgaa tacctctcta atcttatact ccacaaccat ttcgtgatta ttgtacagtc     2460
gtatttcaca ccatggaggg ttacaaaacc tctttcttgc tgggcgaaac gatagtcatt     2520
gtgtttcctg atgtcgtgat atttgcatag ggaggttaat cggtggagtg aaaactaagg     2580
acccgtctat cggatgattt ttatattggt ccattctata tccgatttgg gaggcatagt     2640
catacctgcg ggaatactat ttctaccaca taccgcgtat tgggattggc gtacctatat     2700
tattatatga gctgaggatg gaatagtagg aagtcattat cttcggtcga aaggcgtatc     2760
cttctctatt acagtaggca tgtgagaggc atctgtaccg actcacgaga caaatacaaa     2820
tgagtactag aaagattgaa cccgtgttgg gatctatcca tgaggttcta tcacaagatg     2880
tctgatatag tttttaagaa tcaagcccct atcggacaaa tcatttggag cgttgttgca     2940
gccgtaaact gatcacactt tagccgcacc gttacagtaa tcgtaataga gctccgacag     3000
gaagatcatc ataaaatccg tcaccgtcaa catcatccaa ccaaccccg gtccgtcagg      3060
atcttctgta aactgtccat caaaacgagg tcgagctctg agccatcggt tttgaaattc     3120
gttaccggct taccgttact ttgacatcaa taaattcgtg taaaacaaac cctcttggtc     3180
tataaagtcg tttctaccaa tagtattgat attgaatgct gcccccatag agccccagca     3240
ccggaatttg agaacttaat agtcaactca aacggttggc aaaagaa                    3287
```

(2) INFORMATION FOR SEQ ID NO:558

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 562 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...562

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:558

```
gggcaataac taccgttctt gcatcgtgac agcagaggct gcattgaagc ttatccatac      60
accaagcatc gcgaagagct ggtcttcctg atgcttcagc tatgtacgaa gaggcctctt     120
tcagcgtcag tgaaaagttg caaacgctta ccgtgatgta gcggaccagt actttgccta     180
```

```
catcaacgaa tttcccacgg gaaatacctc aagcaagcca aaaagatcta cgacagcgtc    240
agcaacatat ctcacaagac gcttgacgaa tgctcataca cacccgggga gtctccatcg    300
cagcaacata aaggagacgg cagagggtgg atcaacaacg gaacgatcgg aagaaaaagg    360
ccctgacaca agttccgact aataacaaaa acatcaaaaa gatatatgga gcttaagaaa    420
atgaatgtcc ccatggacac cttacacgtg acatggtgcg tctgagcgaa gacacggaga    480
acgtgtacga gacagtgatg atcatagcca agcgtgccaa tcaaatcggg cagcaaaata    540
aacaggatct tggaaagaaa ct                                           562
```

(2) INFORMATION FOR SEQ ID NO:559

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 926 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...926

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:559

```
tggcgcgaga atgaaaaaaa tctcgcgcca caacgaaaaa aaagtcgcgg tattttgcag     60
aaaagcggtt ccgctttttc tccttttcac gctcgtgatt tcaccccctg ctccggctgc    120
acacccctct ctcctgcaga atgaatactt tcaaataccc cccccgcaa aaaaacaatc     180
aggacacaga gtggggggtat atgccactct atgtcccgat tgcgttagga gggaaatgtt    240
gcttaggatt cgccaccgtt atcgtctgtg tgtggaagta ttttgaacga gaagaactgt    300
gatcgtctca gccgaagcag atttattcga tttgaacatc agtccacctt gcgatcggtc    360
gggattgccg tcaggatata gtcgtaaaaa ggttttcggc ctcgttgcca aagataagcc    420
cctgaccacc ggagggataa agttgttcgt cttgattcgg aaagtagtag gaagcaaagc    480
cggattgaaa cggccgggat attcatgacg atgttcagtg ctttatcctg qgtcttatga    540
cctgacaaga gactgcgttc gaagtggctg tgtattctgt gaatgcattc ctgcaccctt    600
ttgtgtgcgg actgcaaatg gattggtaac ggnagggttc ctcactacca cacgcaccag    660
acgtttgagg tcaggattat cttgtgtccc acaatgatgt ctgacgtaca tgagcctgaa    720
ccgggtgttg cagccatgac aacgaaatcg taccgttgtt gttagtagca ccggttactg    780
catcccgcta tatgtgacgg tgatcagatt gttctgctgt gttacgttgc caaattcgga    840
taataagccg ctttgattgt gcccgttgtc tgcccatcgg taaggccaag taagtatgat    900
ccacttcgat cttacctttc cggggga                                       926
```

(2) INFORMATION FOR SEQ ID NO:560

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 2787 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:

(A) NAME/KEY: misc_feature
(B) LOCATION 1...2787

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:560

```
tgaacttaca gttcttaccg ggcactgtcc tgcaacatgg caacattaca cctgccaaag       60
aaaaatcctt caaagccgtt tgccactgcc cgagggtagc tgtacggcca agcgaatatc      120
cgtatgttcc tcggctgaga gaaagcttaa tctccctgtc cgatcgtaca ggcatagccg      180
ctgggaaact tttgtggata gaattcggtc tatataggaa ttgtttccga ccaaaggccg      240
gcgcaagcca ccgctgcgag agtagaaatc gtacagccat gtttcggcag gaataggaaa      300
ctacagatat cgccacggtc atatatggct gaaagagctt ccgcatcatc gtgcgcataa      360
tgcctttgcc acgatgatcg gggtgtgtgc atctccggaa atataaccgg ctgagaaaga      420
agtgccaaaa attcgcagtt gtaaggaagc atttgcagat gtgctacagc ctctcctgtc      480
tcgctatact tagcaaggta taatcctcac ggaaaacttt gtggaaataa agctcaatga      540
aggctcaggg tctttgaagc agatgcgcca tagccgcaca gatgcttccg cttggattcg      600
gtcatgatcg cgtcgcagta tggctgtttg tttgggcaaa gaatggcagg gcgataagat      660
agtttggcct ggcgcagtcc cggcagccca aatcctcctc gcgattgatg tagcggaatg      720
tgtccggtat cgaacggcaa attctctatt aatcatcgca aacgcgcctt ccaccatagc      780
atcgcctttt cgatatgtac cccaaaagtg tcggtattga taggggagcc taacagaaag      840
ccactacccg gccaccgact cgtagtactc cccccgaaag cccagctcct gacgatgccg      900
aaaagcacgc tctaccatct ctacctccag cctcttccgt cctgatcacc tcggctatcc      960
agccatagat gagccagcat aagcattctt cggcatcgct atccttaaca ggatcgtatg     1020
tatagtcaga tagagagaga caaatttatt gatatgattg cgcttggcct gcaacttttg     1080
cctgacaaag tcgctaaact ttcacgttcg tatatgtagt cgcaatagct tcatcctcga     1140
taaagtaata ctcagccgag caatgttcct ctatactcgg tgaatatcgg gagtcacacc     1200
cataaatatc aagggataat cttcggcact acttctgctt tcagtcgatg ggcagcggcc     1260
actacttgct caggtcagct cccacaggaa agagatagac cggatgacta cggcttttcg     1320
gttgaaacgg atgatcagac agccctccac aatagcccaa gacgtgccat agcgaaactc     1380
cagcaataga gattggaaaa agccaggtcg caaattcttg cactgaagaa aaggtgatag     1440
ttgttatagc tgatctgtca gcaggttcta cggtttgaat ttaatattca ttcgcattgg     1500
ttttgtcacc ccctgttcaa tagaagggga acgttaattt atcggtgaaa cacctttaac     1560
accgaaaagt ttcatccttt tccctatttc aattcggcaa atgtgtcacc tgcggagaat     1620
ctcctgtctc gaaccctcgt ttgaaccaat acatcctctg agaggagtgc catgtgcgaa     1680
agcatcaggt accacatagc cctgcgattg tttccaacag gaagatgggc tataccacag     1740
ggcagatggt ggtactccgt agagataacg ggctatcccg tacggctctt cgagctacgc     1800
tgtagagctc agcaggtacg ctctacagcg tagcgagccg agccgtagag ttccgctccg     1860
gggccgtaga ggtggccgag ctgagccgta gagcttggcg cggtgagccc tcagcgtagc     1920
tcgaagagcc gtagagcgca gctcggtacg ctctacggcg agcccgagtc gctgtagggc     1980
gtagctcgac ccccttccgg agtatattcg aacggctata aaacaatgct tatttggttg     2040
gagtaaaaga gtcgcccgct cctttttatg gaagccgggc gaccgattaa agcgatcggt     2100
tggtagacat accgatcgaa aataatcatc tcgttacttt acagcgagtt tctctagtag     2160
gacttgccgt caacgacaac catgactgca tagtggccgc cctgaccgtg taaacaaccg     2220
tgttgcgacc cgctgccaga cgacgaccgt tcattcgtag atcatagctt cgccttggca     2280
agttaccgtg atcgtctttc ctaaactgtc agcgtgtaag gcttctgagc cgttacgtct     2340
gccaacgaag tgtattcaac gtagcagttt cgatagctga ttctccgttc gggtaaacaa     2400
ctttacaccg tacgtgtaaa aaccggtagc caagtccgga tctcggtaag agtctccgtt     2460
acgcctgatg ctatctgtgt attattacga tagatcgtaa ggtgtaagac ggagcgttcc     2520
ctgaagtgat tacaacatca tcaaggttat ccagaagaag tccgtacagc cgaagtgacg     2580
gaaggcaaca tacttagacc cgcaggcaac tgtaccgtct tttgatacca ggtgccctga     2640
gcacgatacc acgaatggct tcaggtgccg taacaactgt cttggccgtc agcactcttc     2700
caacaaagcg ttggcgaagt tggaagcgtc gttacccgta gaagtgcgta cacggcatag     2760
tgctctgatg cataattggc atcttgt                                         2787
```

(2) INFORMATION FOR SEQ ID NO:561

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 525 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

```
    (vi) ORIGINAL SOURCE:
         (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

   (ix) FEATURE:
         (A) NAME/KEY: misc_feature
         (B) LOCATION 1...525

   (xi) SEQUENCE DESCRIPTION: SEQ ID NO:561

tgaaacgggc tgctacgatg gctatcgcgg atttggcgcg agagactgtc ccgacgaagt      60
actgcgagcc tatggcaata ctcagttgca cttcgggagg actactttat tcccaagccg     120
gtggatcctc gtctgatcgt tcgcgtacta ctgccgtagc acgtgcggca gtcgagagcg     180
gagtggctga gcatccattg cggattgggc tgcttatgag gccgaattgt tgggacgggt     240
gggacgatga gccaccttac gcgtcgtctt catgaatctg ccaagctcaa tcctatcgcg     300
tgatctatgc agcctgcgag aatccttcgg tgctgaaagc tgcgtatcgg cacgtgcaca     360
tggaatagcc cgaccgatca tgttggggga tggaagcaaa ttcgggattt tgccgcagag     420
ttggatttat cttttggaggg ttcgaaatcg ttaattaccc gcttccgatg aaagaaaagg    480
cttcgccgtc ttcattatgc ccgtgtcttt gccgaacaga actgg                    525


 (2) INFORMATION FOR SEQ ID NO:562

    (i) SEQUENCE CHARACTERISTICS:
         (A) LENGTH: 453 base pairs
         (B) TYPE: nucleic acid
         (C) STRANDEDNESS: double
         (D) TOPOLOGY: circular

   (ii) MOLECULE TYPE: DNA (genomic)

  (iii) HYPOTHETICAL: NO

   (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
         (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

   (ix) FEATURE:
         (A) NAME/KEY: misc_feature
         (B) LOCATION 1...453

   (xi) SEQUENCE DESCRIPTION: SEQ ID NO:562

cgacagaaaa acacacgtat gcccagcagg acaaaagcca gtccgaccac agaagagaag      60
ccaaaaaaat tgtagtcatt tattgctata tttgcggata caaaggtaag attttcttac     120
ccacagagaa gcacaattaa taactcaagt aataacaatg aacattacag atctcaaacc     180
cacaaaagtg tggaagtttt ccacgaaatc actcaagtgc cacgtccttc caagaaagaa     240
gagaaatcct ggcttacctt gtgaaatttg cagaagatcg caacctcaaa tatctacaga     300
cgaggtaggc aatctcgtaa tagagaaacc cggcaacacc cggtacgaaa cacctcgaaa     360
cggtcatcct tcagagccat atgggatatg ggatgccgaa gaagaatgcg ccgataangg     420
ttcatgactt tcgaggaacc gccttattcc cgg                                 453


 (2) INFORMATION FOR SEQ ID NO:563

    (i) SEQUENCE CHARACTERISTICS:
         (A) LENGTH: 502 base pairs
         (B) TYPE: nucleic acid
         (C) STRANDEDNESS: double
         (D) TOPOLOGY: circular

   (ii) MOLECULE TYPE: DNA (genomic)

  (iii) HYPOTHETICAL: NO

   (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
```

(A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...502

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:563

```
gccggccgtt gagaaaagga ctgtcgcggc tcttcgtttc gccccgatcg cctgcttctc    60
gttgctgcgg gagctttctc catacagctg acacgagacg actgacagct acttcacgct   120
acaagctgtc ttcatccgac acttttcggt catcgggaat ccggagccac gcgagggcaa   180
actgcgaatg caggtaaact gacaggaggc tcctccccat cttatatcct gtacatccga   240
cacgagggga atacgagccg gtcgctcgcg gcgatatgct caagcttagg aaatctatgc   300
ccgatcggtc gaagaatggg agcagaaagc tccggcaatg gggggtatat ggcgggcaaa   360
ggactgtccg gcagtctgca tgccaagacc gggatgtaga aatcttgtcg acagccaaag   420
ggccgttctc cctcaggcaa aaggctttgg atctgtcgga tcgcttggct gccacattgt   480
acgaactctc ccttcgctac tg                                           502
```

(2) INFORMATION FOR SEQ ID NO:564

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 349 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...349

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:564

```
ggatggagtg gagcgtaagc tgacggccga ggatctgatg atatgcgatc gaacggcgat    60
cccatgtgtg tggcgggcgt tttcggtggt cttcactcgg tgtaacggaa aagacaacag   120
atatattcct cgagagtgcc aatttcaccc gacgatggta cgccgtacgg ctcgccgatt   180
gggtctcaat acggacgttc tttccgcttt gagcgcggat tggatccgga gcgcacggat   240
tgggcttgcg tcgtgctgct tcgcttatat tagagattgc aggaggccat ctcgtgggat   300
gacagatgtt tattccaatc ctctgaaacc gcacctaatc agttgtctt                349
```

(2) INFORMATION FOR SEQ ID NO:565

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 1062 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:

```
        (A)  NAME/KEY: misc_feature
        (B)  LOCATION 1...1062

    (xi)  SEQUENCE DESCRIPTION: SEQ ID NO:565


ccttggacgg tcccctcaat atttgtctca gaaatggatt ccttctcgtt tttctctgtc      60
agtgctaaga caaagataga catacgaaac cataatgcga taatatctat gctaatacat     120
tcaatgataa tcatatccat gcattagaaa gccgaaaaat cacttttccg gtatcaaaca     180
ggatattgag atgaaaggct tttgagcaaa gggcttcttt tcggtggagg aagttttgtt     240
ttcaaaaagg aaagatcaat agtgatatat ataccgatgt cttactgctt ccatacccca     300
tataaatgga aattctattt atccttattt tcatgaacac ataaaaaaga catggaaaaa     360
ggattcaacg cctacgtagg tggaatgtat ccgtattgaa taatatatat ctgcgaggtg     420
agttttccat gtcgatgaat gaatgaactt aagatggctt atcctacgag tataaacgag     480
gaaacagccg tttaagagta ttcaggcctt acattagtct gatgaaaaac aaggggggtat     540
ccggtttaac ataggctctt atttttcctc ctatagacaa aaaacatccc ggaactattg     600
agagagaaat ctctttttta tattgagcca catgcttaat cgaattagta atgagtaacc     660
agcatcggtt aatgctgtct gtctctaagc tgtttctcct tcaaccatcg attacttttc     720
tcagcagatt ttggcaaagg atacaataac ctccaattac cctcaaaatt atcgaaccct     780
tttgaaaaag gtttaaggga aacttatcct atgcctattt cagcttgttt aacggctttc     840
gatgtatggc aatttaagtt atatcaagga tagagatacg caattaccgt cacaacctca     900
aagggactat tgatcagtaa tttttatcaa gtggaggatg gagcaataca ttaagaacaa     960
acgcctattt gagtaaggga tcggcaccct ttcattggac ataaaatatc aggtaaatat    1020
acgctcagca acacaacctg atgcgtgtag ataaagaaga cg                        1062



(2)  INFORMATION FOR SEQ ID NO:566

        (i)  SEQUENCE CHARACTERISTICS:
             (A)  LENGTH: 649 base pairs
             (B)  TYPE: nucleic acid
             (C)  STRANDEDNESS: double
             (D)  TOPOLOGY: circular

       (ii)  MOLECULE TYPE: DNA (genomic)

      (iii)  HYPOTHETICAL: NO

       (iv)  ANTI-SENSE: UNKNOWN

       (vi)  ORIGINAL SOURCE:
             (A)  ORGANISM: PORYPHYROMONAS GINGIVALIS

       (ix)  FEATURE:
             (A)  NAME/KEY: misc_feature
             (B)  LOCATION 1...649

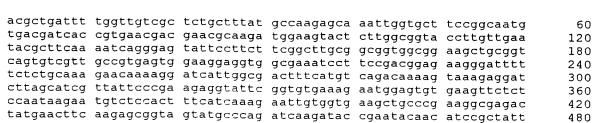       (xi)  SEQUENCE DESCRIPTION: SEQ ID NO:566


gaagaccgtt gcctgtcgtc gactctacag gatccccaac aagctgacac gcttcccagt      60
cgaggattga ccggtgcacc gtacttaagc accagggccc gccagactga atcaaagagg     120
tgaaatgttc gaagctgtcg cgataatctc tgccgtgccg tatatatcca tatgatcggg     180
atcggcagat gtgatatagc cataaaaggt ttcagatggt ggaatgaacg atcgaattcg     240
tctgctcgac gactactaaa tcacttttgt ccgatagcaa cagattcgat tgatattgtt     300
ggaaattcct cccagaaacg cattgcagtc cacatggctc tgttgagcaa atgtgccagc     360
aaagtagagg tcgtagtctt gccatgtgtt ccgcgacaca gagtgcacgt tccatcagag     420
ttatctcgcc gagaacttct gtcgcttcac cacgcgataa ccattggatc tgaagtaggt     480
caattccgag ggtcggccgg cacagcaggg gtgtaaacga tcaacgaatc ggtgggagaa     540
aaaagctttc gggatcatat tcaggtcatc actgaaatga acctcaatcc tcttgatcaa     600
ttgatcggta atgggactcg gagtcagatc atacccaaca cattaaatc                 649



(2)  INFORMATION FOR SEQ ID NO:567

        (i)  SEQUENCE CHARACTERISTICS:
             (A)  LENGTH: 822 base pairs
             (B)  TYPE: nucleic acid
             (C)  STRANDEDNESS: double
             (D)  TOPOLOGY: circular
```

(ii) MOLECULE TYPE: DNA (genomic)

(iii) HYPOTHETICAL: NO

(iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
    (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...822

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:567

```
cgtgccggtc tgctgactac agaccatggc cccatagaga ctcccatctc atgccggtag    60
gcacggtcgg gagcgtgaag gccgtacaca tgcacgagtg gaagaggata ttcgggctca   120
gattatactc ggcaatactt atcaccttat ctccgtcccg gattggatgt gctcaagcgt   180
gccggaggct tgcacagttc aatagctggg agcggccttt gctcacggat agcggaggtt   240
ttcagtgttc tctttggcgg agaatcggaa gatcacagag gagggtgcga ctttcgttcc   300
catatagacg gctccaagca ccttttttca cccgaaaggg tcaggacatc cagcgcgtta   360
tcggagcgga catcatcatg gctttcgatg aagttgcccc ggtgatgccg accgcgaata   420
tgcacgccgt tcgatgctcc taccggaagg tggttggagc gttgcctgtg tagaatgcgc   480
gagacggagc actctatgga tatgaacagc agctattccc catcgtgcag ggatgcatca   540
tcccgatctg cgccgccggt cggccgagat ggtagctgcc gtcgatgcgc cggaaatgcc   600
atcggaggat tggccgtggg agaaccgacg gaaaagagta cgagatgatc gaactgacca   660
acgagatcct tcccaaagat cgtccggcta cctcatgggg gtaggtactc cgatcaatat   720
attggaagcg atagacgtgg tgtggacatg ttcgactgca tcatgcctac gcgcaacggc   780
cgtatgggca gctctttacc tgcacggacc atcaatatcc ga                     822
```

(2) INFORMATION FOR SEQ ID NO:568

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 2778 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...2778

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:568

```
aaaggttcgc ccgtgaagaa ctccgccctc acatccaccg gtctggttct ttcatggaac    60
gctactccaa cagtacgcgc gaagtagctc aagacggcgt cgcggtgcac ttatgctgtc   120
cgtatccatc aagcatcccg attccgatcc ttcatcgatg ccaaaatgac cgaaggcaag   180
gtgacgggag ccaacgatcg gtgaagatcg acgatgaatt catgcgtgcc gttgtcgaag   240
gcaaacctat aaacaacagt accccatcga tgccaaagaa ccgaagtggg agaagagatc   300
gatgcgcgta ccctctgggg caaaatcatc cacaacgctt ggagtcggcc gaacccggtg   360
tactcttctg ggatacgatc atccgcgaat cgtacccgat tgctatgccg atctgggctt   420
ccgtacagtc tccaccaacc ctgtggtgag atcctctct gccctacga tagctgccga   480
ctgctcgcta caacctctat tcctacgtaa agaacccatt cacgagcgaa gcctccttca   540
cttcgagctt ttccgtaacc acgtcgtttt ggcacagcgc atcatggaga catcatcgac   600
ctcgaagccg aaaagatcga acagatccta agcaagaagc cagcgatccc gaaagcgaag   660
aagtcaagac ctcggagcgt aacctcggca caagatccgt cgcaagaccc ttgccggtcg   720
tcgtacaggc gtaggatcac cgccgaaggc gatatgcttg cagcgatggg attccgctac   780
```

```
ggttggacga agctacccaa ttcgccgaag aggtacagaa gaccctcgca ctcgcgccta    840
tagcagctct gtgaccatgg ccaaggagcg cggcgccttc gactgttcga tgccaaacgc    900
gaagagaaca atccctttat agcccgtata ccgaagccga cccatggctg tacgaagaga    960
tgaagcagta cggacgacgc atatcgcctg ccttaccata gctcctaccg gttccaccag   1020
tctgatgacc agacttcctc cggtatcgag ccggtattca tgccggtcta caagcgtcca   1080
gaaaggtgaa tccgagcgac aagaacgtac agatcgacta tgtggacaag tgggcgacag   1140
cttcgaagag ttcgttgtct accaccacaa cttcgtactt ggatgcgcac caacggttac   1200
gaccccgacc gcaaatacac gaacgagaga tcgacgacct cgtggcccgt tcgccctact   1260
acaaggccac ggccacgatg tggactgggt agccaaagtg aagatgcagg gacgcatcca   1320
gcatgggtag accactccat cagcgtaacc atcaacctcc cctccgatgt cacgaagagc   1380
tggtcaatac cctgtatgtg gaagcatgga agagcggctg caaggctgta ctgtctatcg   1440
cgacggttcg cgcagtggcg tccttcacg acaagccga agaagaaaga caagaaagag   1500
gagccggcag ctctccaaac acagtacaga gcatgcttat ctcccgtccg cgcgagctgg   1560
aggcagagtc gttcgcttcc aaaacaatcg tgaaaagtgg atcgctttcg taggcctaag   1620
gatggacgtc cttacgaaat cttcaccggt atagccgatg acgacgaggt atcatggtac   1680
cgaagagcgt tacccacggc aagataatca agaacgggac gaaaacggcg aacgacacta   1740
cgacttccag ttctgcaaca agaaggtttc aaggtaacca tcgaaggctt ggatagcaag   1800
ttcaatcccg aatctggaac tatgccaagc tcatctcggg cgtcttgcgc tacggtatgc   1860
cttcgagcag gtggtacatc tcgtacaggg catgtcgctg aacgatgaat catcaataca   1920
tggaagaacg gcgtggagcg cgccctgaaa cgttacctcc caatggcacc accctgtcgg   1980
gacaggtatg tccgagttgc ggtcaggagc attggtttat caaggaaggc tgcctgctat   2040
gcaccagttg cggagcttca aatgcggata aagcacaaaa ccggcaggt atcggttcta   2100
taacatatac ctctgctgcc actctacatt tcctttactg ttcaagaggg catgtcgggc   2160
tatgattcgg catgccctct tctttgtacc ctttttttcca tattatttgc atgccacaca   2220
cttaattttc tatagatttg caactaatcc acaacattac aagtatgatt acaacattag   2280
gcgagtatgc attaaaagca gctttaaaat cggcttgaat atccacagtt ttcatcgttc   2340
tgaagtcgat gacagatccg atccgctttc gaatatgccg taaatgattg gtcgaaacac   2400
gtgtgggaat aaccacacga atcaacctaa aacaagcatt agaggcctat cccaaaatcc   2460
gacttcattc aagccggagg atcaagaaat acgagattta ttgcctgttt tgagaaacga   2520
cttgctgaat ccaaacacca agcagcctca actacttgac ccaattggag aatagagagg   2580
aacataccca aatcatgcaa ccatcaaaga aaaaggcctt gatccacggg atattgaacg   2640
atacttaaac aactgccaat caaagaaggt caagcaaaag cggaacaggc catcgagatt   2700
tataccaaag tcgtgaaata gaactccctt tgcgcgagat attgaaatca tagtccgaaa   2760
tctgttcgaa cactcggc                                                  2778
```

(2) INFORMATION FOR SEQ ID NO:569

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 1205 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...1205

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:569

```
gctttaaata ttgcagccga tggaagtttt accatcaaga aagaatttag ttggatggct     60
ttgaaattaa agatacagat gttcttgctt tcgtacacat ccaatgtcca atgcggaaaa    120
ccattctatt atcaatgccg ggcaagaagc cttgataaag cagagcctac agctacagaa    180
caaattgttg ctaccccctct gtcaaagcat atgttcagaa tggcaaaatt gttgtagagg    240
aagagattcc aagatggaag tattcaatgc aactggtcaa cttgtcaaaa atgatccctt    300
gtccccggtg tctatgttgt ccgtataacg gcaaacggtg taagtatttc cttaaagtct    360
tggttccttg atttatagag ctaagattta aagaaaactg cgccttctta atgtttata    420
agaaggcgca gttttcgttt tctcattcca ttctccgggt ggtcgtcgaa ggggactgcc    480
tgtcatcttt aaacgaggaa tatcagctcc cctcacacaa cacgatgtcc acaaatccag    540
```

```
ttcatagcct atttgagacc tttgaaaaaa gagaaggttt cttatatcat aaaggcacta      600
aaaatcagtc gattgacaat gaaatctcca agaaaatccg tgcgacagtc tcacttatat      660
agatgcggtc aatggtctga tatatcaggc tgttgtggat ggaggatagt acacatagtt      720
ttgcacctga aacaacgttc atactaaact aaaaacaaaa gcattatgac tcctatcctg      780
aacacgtttt ccccgagttc aaactcaatg cctatcacaa tggcgaattc aaataatcac      840
caacgaagac ttgaaaggca agtggtcttt ggtcgttttc tacccggtga ctttaccttt      900
gtatgcccga cggaattgga agacctggcc ataaatatga agaattcaag caacttggag      960
tagaggttta ctcttgcagt gcgataccca cttcgtacac aaggcttggg ccgacgcttc     1020
tcctgctata agaaggtaca gtatcccatg ttggccgatc ccttcggtgc actcactccg     1080
atctggtatc ctgatcgatg atgttcatat ggcttaccgt ggctcttcgt gattaacccc     1140
gaaggcatta tcaaaatcgt agagctgaac gacacacgta tgccgtgatg cagaagagat     1200
cctcc                                                                 1205
```

(2) INFORMATION FOR SEQ ID NO:570

    (i) SEQUENCE CHARACTERISTICS:
       (A) LENGTH: 465 base pairs
       (B) TYPE: nucleic acid
       (C) STRANDEDNESS: double
       (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
       (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
       (A) NAME/KEY: misc_feature
       (B) LOCATION 1...465

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:570

```
gcaggatgca aaaaggaacg tcagtgcggc gaaaaaaatg agctttctgt tgtcatctgt       60
ttttgtctta tgatggactt aacctcgcaa agatagcctt ttctatatat aatgtagttg      120
ccgtgtacag attccagtta taaatgcaca ctaagtcaga tctagtaaga agcgttcgaa      180
ggggtgggct atattcgggc tgaggcattc aaaacagcgt tctatatggg gctgtgtcaa      240
aatccaaaat ggattttcca acaaaaagac acaaatgcca ccttaatcat atcggaaaac      300
cgctatcaag taggatgatt ttgtcctttt ggtagcggtt tcttatacaa attatacaaa      360
tgatagtatc ctttactcta aacggaattt tgcacactct catctatctt ctgtgatcag      420
aagataggca aggaatcggc tgatcggtcg gtaatggtga gggga                      465
```

(2) INFORMATION FOR SEQ ID NO:571

    (i) SEQUENCE CHARACTERISTICS:
       (A) LENGTH: 563 base pairs
       (B) TYPE: nucleic acid
       (C) STRANDEDNESS: double
       (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
       (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
       (A) NAME/KEY: misc_feature
       (B) LOCATION 1...563

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:571

```
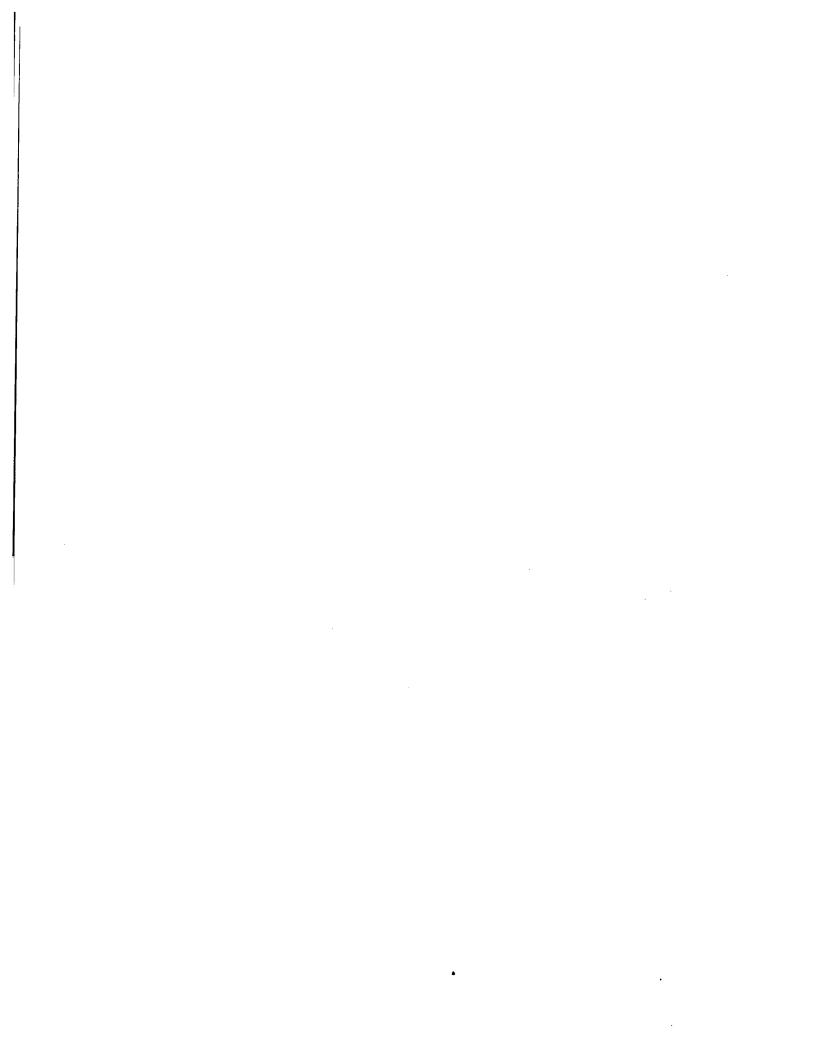ggcagtggca ctttctccat atttgtcgaa cgcgccctgc gggagacctt cattacaaga    60
aatcgcttcg ttacatccat cgctctctcc ttcccggtag gaatggaaag acatgattcg   120
taaggaactg gcagaaaaca gacctgttat tatgccggtg cagacggatc gatgggacat   180
gctttcgttt gcgatgatac gaaccagacg gaacgttcca cttcaactgg ggatggggtg   240
gcatggtaac ggtaatttct atctcaatcg actcaatccg ggttcgcttg gcacggcgca   300
ggcgatggag gctactctac tgaccaagag gttgtcatag gcaagagccc ggccagcaat   360
gaagtccccg gtatcggtac cggatccgac cacacgcttc tatggattgg caacacaata   420
tgtctgatga aagcactttg actgagtgta aaaatcaaga acctactcca catatgcagg   480
gggatgtgaa attggcttat cgcctgacgc ttcccaatgg aacggaaacg actaacccac   540
cgtcaccgtc cctatcgttg gga                                          563
```

(2) INFORMATION FOR SEQ ID NO:572

     (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 843 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature:
        (B) LOCATION 1...843

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:572

```
gccatgcttc gtgccacgac acaggaggag cttttcgctc ttatggacgg gtggagaaga    60
tgataggatc ggctgattca gcggcggtat agtcgcttga caaagctccc cctgccgatt   120
gcttcaatcc acaggtctcc gcatgcaatc cgtcaactcg gcatcatgtt tgccggtgaa   180
catctcgttg tggcatcgca tagcaaccag agcagatgat cgaaggcggt cagctgttcg   240
tccgaagggc ggaaacgagt gtctcggcac aaaggcgcag gttgggaaag agatgaccag   300
tacctttctt ccctcagggg taatggagac acgcatactt ctggatcctc ctcatccggt   360
ctctgctcga tcagattagc tttcagcaga cgcgcatgac ttctgcgccg gatgtttttt   420
ccatggcatt gaggttgttc actctgtctt ggtcatgctc tcaccgttca tcaggctgac   480
cagataggta attcgtcttc ggtctgtaat ggagattccg tcagagcttt cttgatataa   540
aacgggaata acgatggagg aggctgaccc ctcgcgctat gttcttagtc ctgctgctcg   600
ttcccgggtg acagagacaa cttcttcctc ctgtttctct ttttgccaca gcgccaactt   660
aaaaagtcgg caaagtcttt tatttcggtt cgtgcgagcc tccgtcgtgc aaactttcaa   720
atgcatcgag gtagtaataa gatcgaaaag cagttttttg tacttcataa attactccga   780
ttgataaatc gtccgttcga tgtaatcctt ttgaagcata aatgtacatt tttcactgaa   840
aag                                                                843
```

(2) INFORMATION FOR SEQ ID NO:573

     (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 3043 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
    (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...3043

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:573

```
gcatncaagg natatgacgg cccaatggtg atccgttacc cgcgtggcaa gggtgcttga    60
ccgactggcg caacactccg cgactggtcg aaatagcgga ggacgctgtc tgacggaggg   120
cgaagctata gccttcctct ccataggccc ataggcaata tggtacagaa agtggtggaa   180
cggctggctg agaaagtgta tctgcagccc actacgatat ggtattcctc aaaccgcttg   240
acgaganatg ctccatggca tcgcaaagaa gtttgatacg atcatctccg tcgagatggt   300
tgcatccaag gcggtttcgg atcggccgtc atggagttta tggagaccat gactaccacc   360
cacgcatccg acgggtggga gtccccgatc gcttatcggg cagggatctg tgcccgaaca   420
gtatgcagac tgtggcatgg agcagactct ttgttgcact tgaccgaaga acttctgctg   480
catccgtagg aaaaggaacg aaggatgctg cacggatctt acaaacctta atgtagcaaa   540
tgaatattgt tatagccggt gccggcgagg tgggcacaca cttggcgaaa tgctttcgca   600
agaggaacag aacatcgtcc tgatcgaccc caatcccaac gattggaact ggccgccatg   660
cgttccgagc tgctccctca ggtgggaatc cgctttctcc ttcagacttg ctgcaggcca   720
atgtgaagta tgccgtcttt tcatcagcgt gatgccggag gaggcggaca acattttggc   780
ctgtcccttg cctcacgttt gggagcagga aaaacgctgg cacgcatcaa caaaacgaat   840
tcctcaaacc cgacatggca cagtacttcc gcgatatggg agccatacca tgatttaccc   900
cgagctgctg gctgcacggg agatagtatc gccatcaaaa acccgtgggc acgtcaatac   960
gtggagttgt tcgatggggc ttggttctgg tgggtgtgaa ggtgcgtgag ggtgcgcaca  1020
ttgtaggcaa taccttcatg agctgacccg gacgggaaat aagatattcc acatcgtcct  1080
atcaagcgtg accttgagac gatcatcccg aagggggta cacaggtctg catggagaca  1140
tcgtattctt cgccacggct caaaaccact tggatgagtt cgcaagctcg caggcaaaga  1200
caatccgncc gtccacaaag tggtgtcatg ggaggtagtc gcatagctat ccgttccata  1260
gagatgatcc cgagaacata caagtggcga tcatcgagaa ggacaaggag aaaagcatgc  1320
ggacagtgcc atcgctccga ccaacgtaca ggtgtacaac ggtgacggac gcactcggac  1380
atcctcatag aagccgggtt ggatcagacc gatgtattca tgctctgacg gaaaattcgg  1440
agacgaatgt cctcgcctgc ttgggagcca gcgtttcggt gtattcaaga ccatcgccaa  1500
ggaagagaat atagactact ttcattggct gaccgccttg atataggcac gctcatcaac  1560
aaaaaacttt ggccgccggc tccatctacc gcatattcct cggcgaagat acgagtaggt  1620
gaagtgcctg acgctggcca atgccgatgt ggccgaactc gtggctatcg cggagcaccc  1680
gtcaccaaaa gaccggtgaa agatctgaac attccgaggg gattaccttc ggcggcatgg  1740
tgcgcaacgg tgtcccgcaa atgaccatgg cgatacggtg atcgaaccct acgaccatgt  1800
agtggtattc tgttgaatac accactgaat atcctgaaag acttcttcgg ctaacctctc  1860
tttcggacgg cacggcgata tgttgcagca catcaatttc aaattcgttc taaggtggta  1920
ggctctctat gcctgtccga gattctcttt ctgttgattt tctgggtata tccgtctact  1980
acaaggggag cgatctgttg ccctttgtta cactatagga gtgatggccg cggtaggctc  2040
ctgtttctac ctgctgggcg ccgtgctcgt atgaacaacg caagtcggcg cgaagggatg  2100
cttactgcac gctgacgtgg ctgatcctat cgcttgtcgg catgcttcct tttgtctcgg  2160
cggatatact ccctccgtga cggatgcttt cttcgagacc atgtcggctt cacgaccaca  2220
ggagccacga tattccccga ggtggagtct ttgcccgagg cattcttttc tggcgtagca  2280
ttatgcagtg gcaggcggta tcgtatcgtg gtctttacgg tagggctgct ccctatgctc  2340
ggtgcaggaa gtccgtttcg caaatataca atgcggaaac tacgggcatc atccacgatc  2400
gtttctgccg cgtatccgtc aggtgccacg ccggctctgc ggtgtctata tctcggaact  2460
gctgtgctga tactgctttt gtggttgggc ccgatggggt gttcgatgcc atttgccacg  2520
ctttcacttg tatttccacg ggaggctatc cacgcgcaac ggcagtatcg cggagtttca  2580
gtcctcatac atcgaattgt cacctcgttt ttcatgttct acggcagtct cagcatcacg  2640
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gaatatccga gcttggagga aaatttccgt catctctctt tcaaacctat tcgatcatca  2820
gtaccaccgg ctataccacg gcgattactt ctcgtggggg cctttcttct ggagtatagc  2880
tatcgtgatg agattgtctg cggctgtgcc ggatcgacga cgggaggaat caaaatcagt  2940
gcctcgtcgt cctgatgaaa aacttgcgta acgaatttaa gaagcgtacc accccaattt  3000
gatggtacct gtacgaatca atgggattat catcacagac aat                    3043
```

(2) INFORMATION FOR SEQ ID NO:574

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 2375 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double

        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...2375

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:574

```
gtataaatta aatncaggtt gaaagttcgg ggcgtgccca tcgtttcgat tcttgctatt     60
cacaattgaa aaagtaaaaa aatgacatat aatgaattca actggaattt ggagccgttt    120
accgcagagg aacgttccct cgggacatat tctgtcggga gctaaggctc gcgcccgtag    180
tggggtgcct attggccgca ggggaatagc ttccgtagag gaagctaagc gtttctttcg    240
cccaaattgg aggatctcca cgatcctttc ctgatgaagg atatggacaa ggcttagctc    300
gcctgaacag ggcagtaggg cgaaaggaaa aaatcatgat ttaggtgact atgatgtaga    360
cggtaccacg gcagtggcac tcgtctataa gttttgcgcg ccacgggctg ctccgaaacc    420
caattggatt actacattcc gatcggtacg atgagggtta tggtatctct tatcgaggaa    480
ttgatttggc cactctctcg gaacgaaact gataatcgta ctcgactgtg gtatcaaagc    540
gtcgaaaagg tggcatacgc caagtcgctt gacattgatt ttattatcgc gaccatcaca    600
atccggatga aacgtacct gatgccgttg cggtgctgat gccaaaagag ctgacaatac    660
gtatccttac gaacatctct ccggcttgga gtcgggttca agtttatgca agcctatgct    720
cggagcaaca atttgccgaa tccaagctcc ttcctttgct cgacctcgtg gctgtcagta    780
tagctcggat attgtcccta tcatgggaga gaaccgcata ctcgcctatt acgactgcgc    840
caacttaata aacgcccttg tctcggcttg caggctataa taatgtatgc ggtctgaaga    900
agcgaaggat agatatgaac gacatcgtct taagatcggg cctcggatca atgcttcagg    960
tcgtatgatg aatggggggta ggctgtggaa ctactactct ctcaggatgc tgtggaagct   1020
caaagccgac ggccaatata gacgaataca acgaccaacg ccgtgagctc gacaaggagt   1080
gacggaacag gccatcgata ttttgggcga gctatccgat gtggacagaa gatcctcgtt   1140
atctaccggc cggaatggca caagggcgtt atcggctagt ggccagcagg atgaccgaac   1200
gctattcgcg cccgacgatc gtgatactaa gagcggtgat ttcatttcag gctcggctcg   1260
atccgtagga gggtcgatgt gtacaaagcc atcgaacatt gcaaggactt gctggtcaat  .1320
ttcgagggca tcctttttgcc tccggtctga cgatcaaaga agagaatctg gaaccttccg   1380
aaagatgatt acggactatg ccgaagaggc tgtatcgccg gactattggt gccacaaata   1440
gatgtagatg ccgaaatatc catcgaagag tcaattacaa acttctcgac aacctcaagc   1500
ggatggggcc attcggcccg aaaactccaa gccggtcttt atatcccgac aactgtatga   1560
tgccggtgta gcagggctgt aggaaaagct tccgaacacc tgaagataga tgtgagatgg   1620
gatcgggcga acgccatccg gtgagtggga ttgcgtttaa tcaggcggtc attgcgatga   1680
gatcaaaaac ggctcatttc gtctttgcta cacgaagaag agaacgaatt caacggcaac   1740
aaatcattgc aactattggt gcgcatatta agcccgaaga agaatctgct attaacggaa   1800
aaacaagatg aaaaaacgct cacgatgaat ctgggaggca aggtcttcca catcgacgag   1860
gagcctataa cctgctggag gagtatctgac acaatttagc ctcacatttc gtcgggagaa   1920
ccatacggat tgtaagacga tcgaggaatt cgaagcctac tgtccgacat gatggtggtg   1980
cgtttgcata gcgaacacgc cgtaataaga tcggcctgat tcgtgaagtc atagaaaaga   2040
tcaatacggg agagcacttt cttccaatga agacagtacg actgccggat attctgcagg   2100
ggccggtaca gtcagaagga gagagaaact tcaggctatc gatacatgtc cggggagctc   2160
cgaagcggaa gtttttatcgc gacatggatc atgccgtttt gtgtgcgtgt gtagcggtat   2220
tgctgcatat acgagatgga atgtgaatgc tatcgtgtga tagtcgtgtt gatgacgatt   2280
ttggcttctc cgctcttttg gatatcatta tcggttattt ggccgtttgg atgatagctc   2340
caccggctat aatgcttctc agaaattgga gatgt                              2375
```

(2) INFORMATION FOR SEQ ID NO:575

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 840 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

(iii) HYPOTHETICAL: NO

(iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
    (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...840

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:575

```
tacatacggc gctgaccntc gatcgtaggc tcgaaatttt cgaggncgat gtgcgaaaag   60
cctccacgtc accatcctct gcacgccata aagccgctct tgtgaagtgc cacggtcggc  120
tcggaaatga acctccttgc catagcgtgc accaatagat ctgtcagttc actgagcatt  180
tcctgccgaa aggaggcata cgtttttgca tcgggtttat attttgaggt ttcaccgttt  240
gagcttcgtg tttacttggg caaatgccgt gtatcctccc accggaagca aagcagcgac  300
catgccaacg ccagcgatag ctgtttttctc ttcttcatat tatactattg aatttagaat  360
gaatctctcc aaatgtaacg acaatcgagg agtaggatat aaattttgaa taaaaagcag  420
ctatagagtc acgcagtagc gttgtggaaa taaaaagaga cgtacctccg gaggggagat  480
acgtctctgc ttttcgtttt tgtatctgct ctgtatgagc aggggagtga aatcagggat  540
agcaaacgcc ctgagctacc atagccttgg caaccttcat gaagccggga tattggcacc  600
cttcacatag tcgatgtagt tgccgtcttt accgtattaa cgcactgctc gtggatgtct  660
tgcatgatct ggtgcagcca cttgtcactt cttcattcgt ccaaacgagg tgcatagcgt  720
tctgcgtcat ttcgaacctg agcaagaaac accacctgca ttaacagcct tacccggagc  780
gaaggcatct tggtttgctt acatagtatt cgctggcttt cggccgacaa ccctgttaga
840
```

(2) INFORMATION FOR SEQ ID NO:576

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 978 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...978

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:576

```
taaaagatta ggtacttttc aagaaaacca tcaagtactt tcacaaaaaa ttaggtactt   60
tttattggat tatcaggtac ttttgaaaat agatttatat atttgtagat gtatttaaga  120
aaacgccttt cagaggattt ctccgacttg ggaaggttta tcaagtggag actaaaacgt  180
atgtaataat ggcaagaaac cattgcaatt tgtggtcgta gagcgaaaac tgaatgtggg  240
taaaacgcag gtaaagtaat gcagatagca agaccgacgg ggagacatcg tgtaactttc  300
gctcctttttg cgaacgtgta tccaagtcca ccacattcaa ccgcaagaag tcgaggctgt  360
attgaactat gctacagaga ttgccaaaga catgtatcga acggcgacat cgtggagttt  420
ggagaccttg gcacactaat gcttctttca aaagtaaggc ggtagaacag ggggtaaagt  480
tcaatgctaa gttcacatcg aaaagcctgt tgtcttgttc caaccttcca aaaagtactt  540
actctcaccg atgtaagcta tgaacagaca actgccaggc caaagaaaga acaaaacctg  600
ctccaaagcc tgataccgga agtgggggga atagcgggag ggcatataag aattagataa  660
gcccacactt aacctttcag aagttttaaa accagaatag agagtttgct ttgccttgga  720
gcaaactctt tcttttagac ttttctgaat cttgattagc cccttttgtt catcatcttt  780
gagggggcttt tgatggtgtc ggtctcaacg tcttttagtg catcggcaaa aacagtttga  840
```

```
gggaaagagc catctcgtct tgtttgccga cacagaaatg ctccaaatat tccaaccgaa          900
atgatacagg tctaaagaga tatgaaagcc ttttgtctat cactatacaa actccgtttg          960
aatcatcagc atagtaag                                                        978
```

(2) INFORMATION FOR SEQ ID NO:577

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 464 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...464

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:577

```
tattctttgc tcctgagaga gggctggttt ctatcctaag tcgctacaat tcactatcga           60
ggagaactca cccgaggagc aacaagtggc actagaccag agctactcgg caaggtcttt          120
gagaatctcc tcggagcata caaccccaga ctcaggagac tgctcgcaac cagagtggct          180
cgttctatac tcctcggagg ttgtcaacta tatggtggat gagagcctga tttcttattt          240
aggagtagcg atctggtgcg ctctctgttt agaccagatt tcgtactgca ggagacaaca          300
aagtgcaatg cgaagctatt gcaagcaaac tcaaagcagt caaatactag accctgcttg          360
tggctcggga gcattcccaa tgggattgct cataggatga ttgagctact tgagcgcata          420
tctccccaag agaaaagcta tatctcaagc tctttgtgat cgag                           464
```

(2) INFORMATION FOR SEQ ID NO:578

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 1007 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...1007

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:578

```
agcggagatc cgcgtcctct tcgatcctgt cggtcgatca ggagctttct caagcggatt           60
cgggtttttct ccaacgcgca atcttcaccg ctggaactag tataagcggc acggttacga         120
ccctcagtgg tgccataccg catgccttgt cttggcgata gggccgctac aggtgagcaa          180
tgctcgcctg cttttttcctat ttccatgcct gaagatgagg gggtggtacg gttggtggtg        240
aacaaacgga tgagtccgac ctgcaagttg ctgtcgtatc gctaccttca tttgatcgct          300
ggacgatcgg gcattccggc tgcaagctcg tgagcccaga gagtgaatct ttcgcttgcc          360
gtacctcgca atatgcctcc ggggatgaag gagagcctct cgttttggag gtaacctctc          420
```

```
ccgaaacagg aaaaaaagcc gtgattccgt catggtctcc ttgccgctgg tggacaattt    480
ccctgccctc ctgcagccca aacaggcgtt atggaactca gcacctattt ggacatgggc    540
agttggatgg agagacgaca aaggctgcga tagagattcg caacgtcgtg ccggccctct    600
ccgattgcat agcgtcacca cacgcaatcc ggctttgctg ccgtacccga ccggacggag    660
ataaagcccg gcggaagcac actattcgga tcgctgtgga tccgcaggtg atgaaggctg    720
aggggtggca gagtaagctg ccgatatttc cattatttgc aacgatccgc aggctccgct    780
acgtgtatca aggtcaaagc cgaactgtag cttttccccg tagagctgct gccagcggta    840
ctgcaagcga gattgccgc agatctgata aacagaacat tactatggac gaactacttc    900
atcatcccga aaatgatgat tgctataagg gctgaaagtg aacaaaggcg tttccaatat    960
gcccatcatc aatccctacc gaataggaca agacgcaaga agcttga             1007
```

(2) INFORMATION FOR SEQ ID NO:579

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 2523 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...2523

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:579

```
gcaaaatcga aaggaacttg acgttcgcga tagtcgagag cagctctgaa aagtgcgaca     60
ggacggaatc aggaagatgg agacgataga tacctgcagc cgcgaatgtg caaggaatga    120
cgaaagggat tccaaggcga ctcctcctgt ccactgctcg gatcttcttc ggtatggact    180
accgagcaac tatccgaccg gcataaagaa cgatgccgat atggctatat tcttgtgccg    240
aagagccttt ttcctgaaaa gaccggaata ccacgaagtg cctaagcgac agataggtcg    300
ccatcgcgca attccgttcc ttcggggaag gcaggtacaa aaacctttct ttcctgccct    360
gcgagcatgc actcagacag agcagaaaag aagggagaga atgcaccggg taacgaatgc    420
attaagacgc aaaactgtaa accgaaggga tgcttatttc ccgatcgctt catcgacaag    480
ccatttgttg cgatattcac cacatgaacc gtggttgtat catcttcgaa atccagatag    540
tgacccaagc ttccttctcc acaatactat ccttgataaa ggtaaactgt agtttggttt    600
ggcctctccg cccaaagcac catacagatc gacaagctat tggtgcgttc cgtgcaatac    660
ttcttagcct cttcatattt ctgtttgcca tgttctccga gaagttcttt acagcatctt    720
tcgggccgga cgatgacagc cggccatcaa ggcagcggca aacaatgccg ctccgatttt    780
ccatttttca tattagaatt tttactttt aagtatcagt tgcttagcaa agaagcgaat    840
atccctatct cctcattcgt gcaggtgaca ataatcgtcc gaaaaggccg aaaggagaga    900
caaggccagt aaaatgtgga gccggaatca gagaaacatg gttccaaaaa atctgaaaaa    960
tcgaaccaaa acaaaaactt tacgttcggg aattttttc ttttggcgcg agttccaaaa   1020
aattcccgac catgttttta gggatgtgtt ttgattgttt ttcggcgcat gaaaagaaaa   1080
atggtcagct tccccccttcc tcttcgctct ttttcatttc ccccaagtac aacagggggc   1140
gcagagtttt cggatcggac ggattcgatc gggaacaaat ccggccgatt ctgtttaacc   1200
atatgagacg aaaacctgtc gaatgtgcca atatgcaatc atgaatgtac cctttgaaca   1260
gaatcatcaa cttaaaacag tcaattatga agacaaaaag acttttctta ctggcgatca   1320
ttgactatgc agcattcatg catcaatggg gcttgacctc caaaaacgag taaagggaat   1380
gagcaattcg cctctgaaga gcgtttggca gagcctttca cgcctttcgg catcaggcag   1440
cattgatatt cagatcgaat actccccata aggcacccct ccgaatagaa gccgagtcga   1500
acatcatacc actaatcaaa caacggtaaa gaaaggtgtc ctgaacatcg aattcgaaaa   1560
aaaacgttca tatcgcctaa tgctgcagtg cgagttatcg tcagtgtgcc ggaaataaat   1620
cagtcacact gggcggtagt ggcaatttga ttttcggttc cggtttaacc agcccaccct   1680
gaaagtaacc attaacggta gcggcagtat aaactcatcg atacaaaagc ggaacaactg   1740
gacatcgtag tcaatggtag cggtaccttc gcggcagcat ttttgctcat aaggatatac   1800
gcatgaacct gaaggatccg gcaatatcac tctttccata gacgaaacca agacgattca   1860
agtaatatga aaggaagtgg aggtattaag ctgacaggaa aagcttcgaa ccgatactga   1920
gaagttcggg aagcgggatg ttcgactgcc aaagcctgac actgaccatg ccgacataaa   1980
```

```
aatgagcgga  agcggaggcg  gccgcctcat  gtaacgaaga  aaatcagcgt  caatctatca   2040
ggatccgccg  gtttcaccgc  catggaaagg  ctaaaatagg  ttcttataaa  ataggacgct   2100
cttcttcttc  agtatgcaac  cgtaagcggt  tccacatctt  aagccaataa  atacttcctt   2160
tttcgtaaac  gaagaaaaga  cagaagaacc  gagaagagtc  gagttcagct  tttgcttccc   2220
gactcttctt  ttttagctct  caatgcgatt  gaacgaggag  tgatttccct  ctttcgaacg   2280
taatgttttt  gcgcccattc  gagtagagag  ttcgagaaaa  aacggtttga  gatgtaacat   2340
ttcgggggct  tgccgtctta  ctgatagaac  gactaacaag  aaaccaatca  atcatgtgga   2400
caaaagactc  cttttcctcg  tgctcgcggc  agcaagtatc  agttttgcat  tgcccaaata   2460
atctcatgga  aacgcatcaa  gggtaacggt  aaagttcagc  agaagagcgg  cgtataggtc   2520
aat                                                                      2523
```

(2) INFORMATION FOR SEQ ID NO:580

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 513 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...513

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:580

```
gttacgtaga  cttgggatta  aaatgtgcct  gcccctgcag  atggatcgat  cgaatatctg    60
gcacgaggcc  ctcatgagaa  ttatgtggat  cgtaggcaag  tgctttcttc  ggactgtatt   120
ccgaccgtgt  gagccgtatg  gtcgaaccta  tgtacgcccc  cagagtacgg  gcaatagaac   180
cggccttaga  gctctgccct  gacggatgat  tccggcaggg  gtatcagggt  ggaagcttcg   240
ggacagtcga  tttctccatt  cttccctatg  aggacgaaca  tcttgcgcgg  actctcatca   300
atgggaatta  cccatgcctg  cgcatcatat  cttgcgcttc  gacatatgca  gcgcggactg   360
ggcaatggaa  gttgcgggcc  cggtactgct  ccacatacct  ttgcccctca  tcgggcactt   420
attccttcga  acttcgtttt  ctcctctctg  aatgtgtccg  cagctacttc  gaatgcgaag   480
agaacgggac  ttaattctct  ttcggtgaag  ccc                                  513
```

(2) INFORMATION FOR SEQ ID NO:581

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 808 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...808

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:581

```
agacaggatg cattcatgcc tgagatctct tgagcagtcg gattcgtgac gctgcccacg    60
agagcaaaat cgttagaaat gctctaaaaa caatactttc atcatgatag ccattatttg   120
attcgtaatt tttccgtatc tataatttct gatcaacatt tagcgttacc aggtagaaac   180
cgggatcaaa gttggagtat tgaactgtat gctgtaataa ccttcggata gatgtttggg   240
caaccggtta tatcagccga ggctccattt attccatata ttttttattac agaaaggaag   300
ggttatcggt atagtagatt attgttacaa cagctttcgc cggttgggcg aaatagagat   360
tatcttggat ttatcaaggc ttgatttgtt gcttctaatg gaggcaggag agtacctgtt   420
gattcgggaa gagttgacaa caataatttt ttacattttg atggctttcg agcgatttcc   480
tttgttcaca gaaagtatgt tcaaatctat accagtccct ctgagtgagt ctaactgcaa   540
ttccaataaa tgtcaccaag gtcaatgact gcaaaaacac tgtcctgaag gagatttcac   600
tattcaagcg attttcgtac caatcgatgg cagactgtag ttttcacaca caatatcgca   660
tcgcgcagac aggaaatcag ctgtcgggaa caagttctgg gaagagatga tggttggatt   720
ggatctgaaa taatcttcaa gccttcgtaa tcgntgcctg acattttctc tatcctgaac   780
aattcttcaa agcagctatt gcaaaagt                                      808
```

(2) INFORMATION FOR SEQ ID NO:582

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 643 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...643

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:582

```
ggacttacga gaagtttctg tccgagggtc ggcatgggga aatggactac tggagcgcaa    60
cagggagctt cgctattcgc cggcagagct gttgccggta ctcgtacggn tatctccgtg   120
gcactgaact attaccccaa gatcaaaaac cggcctcggc tccacaaata gcttactatg   180
cttatggaaa agactacaca aggtcgtcaa acgcctcttg gacaagctac tggattatat   240
tcgtcggagg tctgcccctc cgtctcggga cggtctttca gcgactctgc tcctttgccg   300
aacgctattg ggcttgccgt gcaggtatcg gctgggtagg gcgagcggca tgctcatttt   360
gccccgaggg ggaactttct ttttcttggg aggctattgg tggatatcga tctgcctccc   420
gatgctccga tgccatcgcg cgtggagctt gccggaactg tatcgagagt tgtcccacgg   480
gagctatttc gaagaaggca tggactctcg tctctgtgtg agctatctga cgatagagct   540
gaggggggaga tccctccgga actggtcggt aaagctgggc aaccgtttta cggatgcgac   600
aagttgccag cttctgctgn ccttggaacc gatatgccat nca                     643
```

(2) INFORMATION FOR SEQ ID NO:583

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 495 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:

(A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...495

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:583

```
aaaagagact aaaaattttc aaacgcaatc gccctgacca tctgtccgaa tgggatccat      60
ggtattatat cgtcttcctc ctcattggta ttgttggcgc tactgtgtac cgacgcggta     120
gccggatgga ttattggagc cggaggagta tcggctcgta tggacgcaat gtgaatcaga     180
cgccacagcg tggcaccaaa gtgcatacac gggtagcgaa gcgatggttg gaggagcaca     240
agtgcgttgc cggtcatgtc gttgaatgtc tcaaaggggc actcattaaa ggggtaaat      300
ttccactagt ggaaaaagaa gtttccactg gtggaaagtt tatttccacg ggaggaaaga     360
tatctttcca ctggtggaaa accggcgtgt acaaatagtc gcctgacaca caataagaag     420
aataaacaaa agcgcctgct tttgtgcaaa gggcccatta attcgaactt gttaataacc     480
gaacgtagca tcggt                                                       495
```

(2) INFORMATION FOR SEQ ID NO:584

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 1393 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...1393

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:584

```
cgttttctat accggggata atggcacaca agccacgacg tttggcctcc gtacctcctc      60
cggattagtc gcctgcatca ggctctcggg atgcgagaca cttgggagcg aatagcttcc     120
agcttacctg tggcatagtc cgtggccgct tcagagaagc atcgtctcgc tcaccttgcg     180
gcagatatgc taccatacac acgcatcgac aagcccctct cgcatcttcg gagcatcgac     240
cagtgatttc ctcttttcgt aaaatcaaat tccggacaga agtgcatggg cgtgccacat     300
gcgaatccag cacaattacg gagcggtcga ccgctttggc ttggcaaaga gagaagcctc     360
ggcgaccaaa tgctcgaaca attgctgctg acggtgtcac cggcataggc catttgctcc     420
ggatgccatt gtaccgacag gtaggtttct ccggataggc ttccatagcc tcgataacgc     480
catcggaaga agggctgtca cgcggaaagg tttcggcact ctgctgactg cctgatgatc     540
aggctattga cacccagcag ctcgccatcg cttaggccaa gtattcgtcc aagacggaat     600
cgccctgtaa acggacttgg tgtgccgcaa acgatatggg attttcggat taagccctac     660
cggatttttcc gactgggcat atatatctga tacattcctc cgccgaaagc tgtcgcaagg     720
agttgatgcc cccggaaata ccgaggatcg gcacattgcg gcgagtggct tctgccacca     780
atagagttcg ccccgatctc gctcgggatt gacttcgccc agtgtgggaa tgggtcttct     840
cccaaatagg acgggagtaa atcgtcccca ccggaaagaa tcgcccatcg atgaacgtgg     900
cataatgacg tatgacctct atatccgtag taaagggata agtaagggta aacctcccgc     960
acgtattaca gactcggtat ggctctggca atacacgagc ccgaggtatt ataattcgct    1020
gtcaaaccat aacaggtcga gagggagact ctcctccctc aaaagcttgc ggcgcacctc    1080
aagctcttca tagagctgtc ggagcgccgc aggataatac tgatagtctt aggactaagc    1140
atctattctt gcataagtag cattttcttc tataaatccc tgcgcggacc tacctcgtct    1200
cccatgagca tggagaatat ggcattgcct cagcagcatt ctcgatcgtc accttacgaa    1260
gcgtcctttt ctccgatcca tcgtcgtctt ccaaagctgc tcctcgttca tcttaccaag    1320
gccttgtacg cttgtacatg cacacgggtt tcattaccat cggcataacg gtgacaaacg    1380
cttgacgctt gtt                                                        1393
```

(2) INFORMATION FOR SEQ ID NO:585

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 443 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...443

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:585

```
gctctttttg gcaccggcta cggtctgatc gaatttggat ttctgagccg agcttccgtt      60
gcgggcttct ttttttcga gcgaaagaag taatcgcttg tgcttcagcc ttgaaaacgg     120
gcaggatgca ggcgacagcc atgcacgagt aaagattctt ttgttcatgc ttgattatag     180
ggtttgattt atgattattt ttcttctgtc gtagcaccac agaggcaagc cggctcggct     240
cccgttatgc caagagatcg gccggtgcta tccgaagctg taagcctcgc acaccgcgct     300
gacatatata taagggaata ccatgcaagt atgatggata tagatggata agcctttttc     360
atcccgatgg gcgaacagcc ggcacggata taccccgtga gcggaagaag ctcgctctgn     420
ctgatcattt tccacgcttt ttt                                            443
```

(2) INFORMATION FOR SEQ ID NO:586

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 1790 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...1790

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:586

```
ccttgtattc gcagagacga tcggccgcag gttcgtgtcg tagacgccga tcgcagcgtt      60
ttctccgccg gtctattcgt agctgtgctt cgttgcggtc agatcggccg ggtagcccag     120
tacatcggtc agataatgga caaagtgtgg cgcacccact cctccggcgt cagagccaca     180
tagcgacgcc gaatgcgtcg aaaatgaaca tggactcatc ttcttggtga atacgatgtt     240
cgtaagggga aggtttagtt gaatcatcct atctttgctt cgctcccgaa tcttgaattt     300
ttggaacgag tgttacaaat ataggtctgt tttcatgaaa acgagcaaga gatagttgag     360
aactggttac cgcgatatac gcagaggcag ctatcgattt cgaaccgtac atcctgctga     420
cgaacttttc gcactatctg ctgtcttcgc cgagcactac ggggtaccta tcgtcggaga     480
acatacctcc tgccgaatgc ttcggccgaa ggcgtcaccc tcatcaactt cggcatggga     540
gtgccaatgc ggctaccatc atggacttgc tctgggctat acaccccagg ctgtgatctt     600
tctcggcaaa tgcggaggcc tgaaactgga aaatgcttgg gcgattacct cctgcccata     660
gctgccatac gcggcgaggg tacgtcaacg actatctgcc cgaggaggtg ccctctctgc     720
```

```
cctcattttc cgtacgcgag ccatttcgtc agccattcag aacaaaggca aggactactg    780
gacagtacgg tctatactac gaaccggcgg gtctgggagt acgatgagaa gttaaggact    840
atctgcgcag tacgcatgca agcggcgtgg atatggagac ggtacgctca tgacggtagg    900
atttgccaat aagattccca tgggagcgtt gttctgattt ccgacagacc tatgttccca    960
gaaggtgtca agacggaaga agcgatcagc tcgtaacgga caactttgcc gaagagcatc   1020
tgatgcttgt atcgatgctc tcgaaatcat tcgggagaac aaatcttcca tcaagcattt   1080
cgcttcaact ggtaatactc cccctcatc tctatggcct cctattcgat attgtcgatt   1140
ctgtacgtaa gtgccaattc tcgccacttc tatctgtggc cggccgaaag aaccccttcta   1200
tatagacgag ttggccactc tgctgagacg cacgtggtgc cggtagatga atgggacttt   1260
caacagggtt atccctacgg cgacaaaacc tccgtagccg atatagcgaa cgaagcgcgc   1320
cgttcccgat gatgggccgg aggcagttga tcgtcgttcg ggaggcgcag ttgtggacaa   1380
tatcgacttg ctcgaagcac attatggcac tttccccgat atacgattct ggtcattgcc   1440
tataagaaga aacccgataa gcgaaaggct tctatacgaa ggctgaaaag ttcgggaaag   1500
tattcgtgtc cgagaccatc ccgactataa gatgccggac ttcatcctgt cggctgctgc   1560
cggcaagaac tgagcgtatc gcccgaagtg gcatatatgc tggccgatta cctcggcatg   1620
atctggagaa gttgatgaat gagctggaca agctcattct cataaccaag atagtagggg   1680
agtggtcacg tccgagatcg tggagcagca tatcgagtaa gcaaatcctt caataatttc   1740
gaactccttc gtgccatagt caatgcgaaa cgggcaaaac ctttcgcatc                1790
```

(2) INFORMATION FOR SEQ ID NO:587

    (i) SEQUENCE CHARACTERISTICS:
      (A) LENGTH: 970 base pairs
      (B) TYPE: nucleic acid
      (C) STRANDEDNESS: double
      (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
      (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
      (A) NAME/KEY: misc_feature
      (B) LOCATION 1...970

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:587

```
agaaaggctg gcgtctgctg ctatcttcca aaagccatac gctccttaag aagaggactt    60
cttcacaaaa gatgagcgca tcgggatacg caaagatttg aaggagcaac gaacgatgat   120
gctttcttct gtcagagata ctatcgctca aaaatttcaa agaggtagag ggcgaaaaga   180
ccaaggtgtg caagcaccac ccgtacgaga gcacgacttc tgctttgcgg tgcttttgga   240
gaccccaggg atataaaaca cgaagagttg aataagagaa tcgtctacct cggtgagaac   300
gacaaccttt tcttatggat cttatggagg taagtgaaga gacttcaaac tcaacattga   360
gagttctact cttacgagcg atgagaagca ctcaccgtgg tacttctatc cgatgctatg   420
attgaaccta agctccttga ggggtaaaat ttgcaagcac ggaggtgaaa gactttgcct   480
gtttgctcac catgtaggaa cacgcaggtt ctacaacaag aagaagaaaa gagaggaacg   540
aacatcgaag aagttgaaac ggctctaagt caccaacatg aactataccc agaggttccg   600
tgttttactt cgatactaaa gagcaagcaa atcaatttgt gaggacctcg agaaggtccc   660
caacttccat accatcggct acaatctgct atcatcatcg aaccaacaaa aacaaaaaaa   720
taacaacaat cagaaatgaa aacagcagct tatatgatcc attgccttac caatatgcat   780
gtggtaaggg agatgccacc tacgaagtgg tggacaaatg tgtacagcga gattaaccac   840
agggatgccc tgcatctact cctccagcct caaggagctt tggacagttc ttttcgaaac   900
aaggctttgc cgagcttaac tattgttttt ggaagatcag agcagggtta gaaaaatatg   960
gcatgagaag                                                          970
```

(2) INFORMATION FOR SEQ ID NO:588

    (i) SEQUENCE CHARACTERISTICS:
      (A) LENGTH: 946 base pairs
      (B) TYPE: nucleic acid
      (C) STRANDEDNESS: double

```
          (D) TOPOLOGY: circular

     (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

     (iv) ANTI-SENSE: UNKNOWN

     (vi) ORIGINAL SOURCE:
          (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

     (ix) FEATURE:
          (A) NAME/KEY: misc_feature
          (B) LOCATION 1...946

     (xi) SEQUENCE DESCRIPTION: SEQ ID NO:588
```

```
ggacgattgg aatacaatat ttatagaagt gcctatcagc acatttgctc ggtcaagacg      60
gtcaatgacc tcttgcgacc tgagcaccaa ccctgtcaag ctaaaataat caacccataa     120
taaacaattc cccaaaaatc tttttaaaaac aatgacaaac gatatcttgc agcgtcttgc    180
gtctttgcgc aaagtctgag tcatgagcat atcgatgctt atatcatccc gagttcggat     240
gcccactaag cgaatacaca ccggaacact ggaaaggtcg ccgttggatt tccgtttcac     300
cggatcggcc ggcacagtag tggtcacagc aaataaggcc ggatatggac ggacggacgc     360
tacttcctcc aagcaggcca acagctcgaa ggacttctat cgacctctac aaagaaggca     420
tccccggaac tccctccatc gacagtttct tgccgccgag ctgaaagccg ggcaaacagt     480
gggtatagat gacgttgctt tccggcaggt gctgcctctg caaccgaatc ggctttggaa     540
tatacggcat caaactaagg actgacaagg atcttttcga tgaagcatgc gagatcgtcc     600
agaaatccct cgtggagagc ttttcgttca gcccgtgagt atgcaggaga aagcgtgaaa     660
gacaagatcg cacgtgtcaa taaagactgg cgacacaagg tgccaatgcc actattatca     720
ccatgttgga cgaatggctt ggatattcaa tcttcgtggt agagatgtgg agtgcaaccc     780
cgtagagttg cttttggtta tgtatcggct cgagaatctg tcctctttgc tttcctgaga     840
agattactaa ggaggttcgc tcagctatgg aagaaggcgg ggcaagaata tgccctacga     900
agccatatat gaatatatcc cagcactacc tccgaataaa gctgct                     946
```

```
(2) INFORMATION FOR SEQ ID NO:589

        (i) SEQUENCE CHARACTERISTICS:
            (A) LENGTH: 4250 base pairs
            (B) TYPE: nucleic acid
            (C) STRANDEDNESS: double
            (D) TOPOLOGY: circular

       (ii) MOLECULE TYPE: DNA (genomic)

      (iii) HYPOTHETICAL: NO

       (iv) ANTI-SENSE: UNKNOWN

       (vi) ORIGINAL SOURCE:
            (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

       (ix) FEATURE:
            (A) NAME/KEY: misc_feature
            (B) LOCATION 1...4250

       (xi) SEQUENCE DESCRIPTION: SEQ ID NO:589
```

```
gagatgcaga tgttacctca cacatgggcg catctacggt atgcaaggtg ctgggagatt      60
tccagcaagg tatgttcgaa gcagcttgca gaatgtgagc cgtggtacaa cctggccaaa     120
gcaatacgtg gggagccttg agcctcgcca cgtctatgaa ttcatgggag gcctcacgct     180
ctctgtccgc caagtcgggg caaagatccg gaagcatact tcaacgacct gcgcaatcgc     240
cacaaacgcg cgtgcaagag ctgaaacaag ccatcggcgt cgaagccaga accagatcct     300
caatcctact tatatccaag agcagctcaa agagggacag aatctgccaa cggcattgcc     360
gaaactatcc gcaataccta cggctggaat gtatgaagcc ttcggccatc gacaaggaat     420
tgtgggatga catctacgct attatgtgaa ggatgagaag aatctcggcg tccacgaatt     480
tttccgcgaa acaaccctgc cgctttgcag gaattcacgg ccgtaatgat ggagaccgcc     540
gcaaagggat gtggaaagct accccgaac agctaaaggc tattgccgat tgcatgccaa       600
```

```
atccgtggct gaattcggag ccggctgtag cggattcttt gcgacaatgc caagctgcgc    660
agcttcatcg gcgaacgcct cgatgcagtg acaagaaagt ttacgaagaa aaggtagccg    720
atgctcgcga agtatgatca aggatgccaa aaagggacgg cgactcaaga aagagacccg    780
ctcggtgagg atacctccag ccctgtcacc tcttacctgc tgcctgcagg agtgcccttg    840
tggtgataat cctgatactc ttcctcattg ccaagcgcag aaagggaaag aatgagagaa    900
gtcctgctga ctatagcctt attggctacg ccaagtatct gttcgaggag ggagtacata    960
attccctcct cgtccgttgc tgcatgcggc ggtctacgcg gctttcatcg cactcgtaca   1020
cggactgacc agcacgtcag ccggatgaca gtcgagaccc tcctgtactc gcccgaagcc   1080
tgcgcaatgt ctctctggcc gtcatggtgg atctgctgta cgtcgtaata tatgtacgca   1140
ccggccctcc tccttccgct tgtaccgcac ctgggtcgcc atctgccccc gctcctgttc   1200
ttccccaccc tcttctatct gcgtcgagtc tgttctacgt cctgccgggt tattcattcg   1260
ttggagtttc catctgatgg ccctcatagt ggcagccctg agtataacgg ctccctatct   1320
gtgagagcac tcggactcaa gcgagaagcc ttgcgagaac cacttgttct acttcgctct   1380
gcacctttgt cttcgtcatt gcagccggag tattgcaccc cactccgcgg tgcgaacagc   1440
cggcatcact accgactggt ggcaggcgct tatctcttcc tgatcgtctt ggcaggtgcc   1500
tcgatcggct attttgccct cgcttgtggg ctataatcag aagaaaaaac aactgaaaaa   1560
aataatcacg aatcggaccg gatcctcatc ccacgccgaa ccactcacta acaatacttc   1620
ccaatgaact tcttgtccaa cgtcatgttt tgggtctcca acggccgttg gtaccggtag   1680
tcgccggact catctatctc ttcatcaaat ccctttcctc ctcggcaccc tcttcggcac   1740
gtggcagagc taccgccgcc ggcagagacc ttcgcctgca tcatcgaaaa caaagccggc   1800
ctcgacaccg aagcctcaga gccgaagcgg ccaaacgccc ccacgctccg ttcgaaaatg   1860
tgtggccgaa gtcctcgatg cagattccgc ccgtcgcaat ctgctcatcg gcggtacgaa   1920
ctctctcgtg aacagcgtct gagttcggcc aagtactta caagttcggc ccgatactcg   1980
gtctgatggg tacgctcatc ccgatgggcc ggcccttgtc ggactctcca cgggcgacat   2040
cggacagatg gcctacaaat gcaagtagcc tttgccacca cggtcatcgg tatgtttgcc   2100
tcggctgagg gtatatagcc ctgcacatcg tgcgcactta caatcggaac gacctctttg   2160
gctcgattac atcaacgaaa aactctcctg atcgccatgt ccagagacgc ttccacgaag   2220
aagacacgga tccttcctca cttgtatcca acctttcgac gtagccatgg tctttgccgt   2280
ggcactgatg gttgccctcg tcacaaattc aacatgaccg aagtcttcag caaggaagac   2340
tacacaatcg tcagaatccc ggcaaggaca acatggaaat cttgatcaag aaaggcgaca   2400
agtggagaag tacactccgt ccgacgaatc ctccgatgga gccggcagca aggcaagcgc   2460
gtaggtgtag cttaccagct cgaaagcggc gaaatcatca cgtgccggaa gactaagacg   2520
gagaaaccgg ctattatcat ccgccctcag cccaaaagct cttttttcta tttcctccgg   2580
ccctgcgaaa gctctttcgc agggccgatt ttttatatcc gctccccttc cctctctctc   2640
tgcatgtctt cagactaata gcttttgctt ggtcctttgc attgtatgag actttgcaca   2700
acaagcaggc acatttgttc attcttctgt ttgcttggca gtcaacacct gcttgctatt   2760
tgatctttcc cggagataca aagaatgaac ccaacgagag gatattatgg tctctcatga   2820
gaggatacta tggtctcata tggaggatac tatggtctcg catgagaaga tattatggtc   2880
tcacatgaga gatactatgg tctcacataa gaggatacta tggtctcata cgagaggata   2940
tatggtctca tacgagagga tactatggtc tcatatgaga ggatactatg tctcatatga   3000
gaggatacta tggtctcaca tgagaggata ctatggtcca catgagagga tattatggtc   3060
tcatacgaga ggatactatg gtctattatg gaagatgcta tctgctctgt gtcggatggc   3120
agattcgggg agtggggggtt ccgtgtgagc tgtgaaaccg atagatgtgt ataggaacag   3180
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tgctccaaca agagtttgat cgttaagttc ttatgagagt cagaccatat gcttatatcg   3300
aactcatgta atgaaagata atgtctataa aacaaatcca tcagcaaggc cggaccttgc   3360
tgatggatta gaaaaaactg tgttgtccta agacctgtaa tgcttttaca ggacaagaca   3420
atgccccgac atttgcggaa tgggggcttc acgatctcag ccttgagttg acgaccgcga   3480
ccatgatgcc aagctctgtg ccgacccttgt tgaactccgt agccacatgc ccataccgat   3540
acctttctta aggcaaggag acatcgttcc ggaagtacct ctccgatgat ttgcccttcg   3600
gcattggcaa tttcatagtg ctggcgggaa tacccttgtc tttcagttcg aaggcaacga   3660
gcttgcgctt gagactccgg ctttctgctc ttccatgatc ttacggctcg gcatatccat   3720
tttgcgtcgg tgaacttggt gatccagccc agcccagcct ctatgggaga agtgtgtcgc   3780
atatatcatt gccatagaga cagaaaccca tctccagacg aacgtgtcgc gagcaccgag   3840
tccggccggt ttgatacctt cgggcttgcc gcttcgaaga gggcatccca tatcttctga   3900
gcgtattggg gatagaaata agttcgaagc cacctgctcc ggtataaccc gtagccgaaa   3960
taattacgtg gggcatccgg cgaaagagcc tactttgaac gtatagtaag tgatctcgtc   4020
aggtcgatgt ccgtgaggcg ttgcatcact tccgttgctt tcgggcctgt acggcaagtt   4080
gggcgatgtt gtccgaggca ttttccaata tggctccatc gtattctgct gccggcacca   4140
ggcccagtcc ttggcgatat tggcacgttg ggtaccatca tatattttc ctcttcgtag   4200
cgatagagca ggaatcgtcc actataccac cgtcgttatt ggggaagcag              4250
```

(2) INFORMATION FOR SEQ ID NO:590

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 525 base pairs
        (B) TYPE: nucleic acid

```
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

   (ii) MOLECULE TYPE: DNA (genomic)

  (iii) HYPOTHETICAL: NO

   (iv) ANTI-SENSE: UNKNOWN

   (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

   (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...525

   (xi) SEQUENCE DESCRIPTION: SEQ ID NO:590
```

```
cggctcgcag atgcttagcg ccaaggcggt aaagagccgc agcggaacct tatacagcag      60
ggaatagaaa tgagcattat tggccggatt gtccatcagg caaaatccag ctcatgcccg     120
gtacggatca tccaacggga atcggagctt tgagagggaa cgtcttctct cccaacaaat     180
tcagtgtcca tcctcctaac gaaggggtga caaataggtg tcgcgcgtta tgcttccgcc     240
accacgacca tataggcaga atgaatgcgg taggcggact gctccgtggg caacctctac     300
tcgaagaatc agttgcaaac gctgtattgc taccgtggga agatcctgcc cccatgccaa     360
caatccggtg agtagcagaa gcggcaaaac aatgcgtatc gtctattcgt tttcatcgtc     420
gtcgaattgc aatcgctgga tcccaagagt tcgtctctta tatcttcatc ggaagcaatg     480
gcttcgggtg aacctcggcg aagctctcgt ccggatcggt tgttt                     525
```

```
(2) INFORMATION FOR SEQ ID NO:591

     (i) SEQUENCE CHARACTERISTICS:
         (A) LENGTH: 5545 base pairs
         (B) TYPE: nucleic acid
         (C) STRANDEDNESS: double
         (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
         (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
         (A) NAME/KEY: misc_feature
         (B) LOCATION 1...5545

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:591
```

```
ttccgaaatg caacgaggat atagtcggca tcttccgtct gatactcttg gtaagcgaac      60
ttcattggct tcgatctctg catacttctt ttggaagcgg aggttgttct gctccataac     120
ggccgaatca agctcgagag aggtaatata ttcggctgac gacctccttt tcgaccgaga     180
gttgcccacg ggcatttttg cggatttcat cttcggtacg acgctttttg aacggaggca     240
atatcccttt tccatcatct gaccgatgat accgtcggaa aggatgagtg caggttgcgg     300
tacttgaatg ccagctccag tcccagacca acgaagtcaa ccactcttgt acggagttgg     360
gtgccaatgt gatcagacga tagtcaccat gtcaccaccc ttgacagatt ggaaatagtc     420
ggcctgtccg ggttggatgg tcccaagccg ggacccccac gcataacatt tacaatcaag     480
cagggcaatt ggcaccggca caatagctca ctccttcttg cttaagactc atacccgggt     540
ggaggaagag gtcatcacca ttttgccaca gctggcaccg ccataaacat gttaatggca     600
gcgacttcgc tctctgcctg caagacaacc ataccggcgt atcccatgga tgctcctcca     660
tgagcgtttc cataacttca gactgcgagt gataggatag ccgaagtagc catccacacc     720
gttacgtatt gccgatcgc aagggcttca ttgcccttca tcagccttat ttcttctgtc     780
atatttttct ctgttttgt tacaatttca ctttgtaaac cgtgatacat gcaccgggca     840
taccgttgca caactggtgc agccgataca gctttcggga tcttcatata agagtaatga     900
tagcctttgt cattgacttc attcgggtgt actccagcac ttttgtcggg caagccacta     960
```

```
cacatagatt gcaacctttg aacgctgggt attaacgacc acagctcctc tgattttttgc   1020
cattatagta tcttttttaat aaggacttcg aatacctaaa agtgagtaat cttgacgctc   1080
aaagataggt attctttccc tcctgatacc tataaagacg gttttttgat cgtttacgtc    1140
tttttttgtcg ggaaaatgtt ctttagcatg ttttggctcg tgctgttgtg atgaagtcaa   1200
tccgagataa gactctttca agtcgagtcg cctatatcac ccctatcaat cagggcaata   1260
cggtgcgatc ccccgacgat gcgctaactc gcttttcatt tcgttcatgc tgcgcagttc   1320
gttattattt ctaattgcaa ttcgatgtcg ccggcttttt gagcttgtgc gattcttttt   1380
gcaaagcacg gatttgtacc tgaataaaaa catttttgat gtgagaagtt cgcgttccac   1440
tcgcatctga aggtcttctt ccgcattgct tcatccccctt tcccatagtg aatacggctc   1500
aatgcatagc ggttggtcat agctcgactg cgatatgact gatctgtgca ttggggtgat   1560
ctctgaaaat ttggctgcga caaaaccact gtcgaacgat tgttcggcag cctcatcaga   1620
atctgcctaa acacatcagt accaatatcc actccatccg cattcagtct gatttgatgt   1680
aatatgccaa ggcaacctcc gatggagtct gctttccgct ccttcttcat gcctgtatat   1740
gaggagtttt ctttcgccgt agcgatgatc agacggagta actcctcttc gtatttggcc   1800
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gtggcgggtt gcggggagga gtacgtactc ctacggaacc catcttttgg acttcgcgag   1980
ccagcagtcg ctcatccata ctaagcgttg gcctgtctct tggacataga cacggcgtgt   2040
gatgtcatcg gggatcaggc gatactgccg ataatatcgg taattagctg tgctcttcgt   2100
atggggtacg ctccatatcg ctcagataga gctgtgtctt gaagcgaata aaatcctttc   2160
atgctgctcg atatattctt cgaactctgc tacggtatga ttgcggcaaa actgtccgga   2220
tcttctccat cgggcaggag ggccactttc acgtcatgcc ttgctccagt agcaggttga   2280
tacctcgcag agctgccttg attcagccgc atcaccatcg tatagaactg tgatgttcga   2340
agtaaagcgg tgatttggtt gatctgctgc tgtgtcagag ctgttccgga ggaagccacc   2400
aattttcgat accggattga tgcatcgaaa tgacatctgt ataaccctca caaggaagca   2460
cttatctcgg cgagcaatct cttttcttggc caagaatagc cgtacagctc tttgctcttc   2520
gagtagatga tgctttcggg agaattgaat acttggcggc cttgtctttc tttcctaaga   2580
ttcttcctcc gaaggctcga tcttgccgct tacggtctgt acggggaaaa tgactcgccc   2640
gcggaacggt catctaaggc cttgctgtct tcgtatcgga tggaaagccc tgtgtgacta   2700
agtattcggg cttgaaccct tttcgtatgg cttcgtcgct gaaaccgacc tcttttcagg   2760
agcatagccg agttggaact tctgcacagt ctcggacgaa tacctctttg gcggaagtat   2820
gtcatcccaa tggtctggcc ttgatggtat tgagaaggtt gttttttgaag aagtcattgg   2880
caaactcatt ggaatgaaca tactttctct atcgctcttg agtttcttct cctcatcggt   2940
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(2) INFORMATION FOR SEQ ID NO:592

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 3292 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...3292

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:592

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ccagcttgtc atgatcatgg aaacggtttt gtcgtctccg aagccgaggg cgcggtgcca     180
ctgcatacgg aggttttcca cttctcgaac cattgcagct cttcacccgg tcgtacgaag     240
aactgatctc catttgttcg aattcgcgca tccggaagat gaactgacgg gctagatctc     300
gttccggaaa gccttgccga tctggcaaat tccgaaaggg atctcattcg tcccgtcttc     360
tgcacattca ggaaattgac aaatatgcct tggccgtttc gggacgaaga tataccttca     420
tggcaccgtc ggccgtagag ccatctccgt ggcaaacatc aggttgaact ggcgcacctc     480
tgtccagtta gcgtaccgct gatcggacag acgatctcgc agtcgaggat aatctgacga     540
tttcctccag attgttgtca ttcagtgcag tagcaaagcg ttcgtgtact gatctcgctt     600
ctgttgatat tcgatcacac gggcgttggt ggctcggatt gagcctcgtc gaatgcctcg     660
ccgaagcgtt tggctgcttt ggcgactctt ttgctatttt ttcatctatt ttggccagat     720
gatcctccac gagtaatccg cacgataacg ctttttggaa tccttgttgt ctatgagcgg     780
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```

(2) INFORMATION FOR SEQ ID NO:594

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 538 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...538

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:594

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cgtggagtca gatccattac tttcagacct cgggcataaa tctcatcgta tgtgtccggt    300
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cgaacttcgt agccgaggga tccttctccg gatctgccgt gtaataccat ccacgcgcgt      360
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(2) INFORMATION FOR SEQ ID NO:595

      (i) SEQUENCE CHARACTERISTICS:
          (A) LENGTH: 2029 base pairs
          (B) TYPE: nucleic acid
          (C) STRANDEDNESS: double
          (D) TOPOLOGY: circular

     (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

     (iv) ANTI-SENSE: UNKNOWN

     (vi) ORIGINAL SOURCE:
          (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

     (ix) FEATURE:
          (A) NAME/KEY: misc_feature
          (B) LOCATION 1...2029

     (xi) SEQUENCE DESCRIPTION: SEQ ID NO:595

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```

(2) INFORMATION FOR SEQ ID NO:596

     (i) SEQUENCE CHARACTERISTICS:

```
      (A)  LENGTH: 2702 base pairs
      (B)  TYPE: nucleic acid
      (C)  STRANDEDNESS: double
      (D)  TOPOLOGY: circular

   (ii)  MOLECULE TYPE: DNA (genomic)

   (iii)  HYPOTHETICAL: NO

   (iv)  ANTI-SENSE: UNKNOWN

   (vi)  ORIGINAL SOURCE:
         (A)  ORGANISM: PORYPHYROMONAS GINGIVALIS

   (ix)  FEATURE:
         (A)  NAME/KEY: misc_feature
         (B)  LOCATION 1...2702

   (xi)  SEQUENCE DESCRIPTION: SEQ ID NO:596
```

```
tttgcgtcgg  tttcgtttgg  tttcggccag  ttggcggatg  gcctgttcgt  atgacctccc      60
gattttttctg  ccagctgaag  cacttccatt  tttttccggct  cttccgttgt  atagcagaga     120
tacttctttc  ggccgaagac  ttcgggtgca  tagacagccg  attgcgtgcc  gcccagcccg     180
atccagacct  ctttgtgagt  ctggacggat  cgttatccat  attgatggac  aggatctgcg     240
acttcccctta  tcggtcagcc  cgaggaggtt  ctgtatctgg  tcgaatttgt  tggctacttg     300
cgctggtcga  gaagaatctt  gcaatccgaa  ttgttgatga  tgcctccttt  accaccggcg     360
aagagatgat  gtcgtccacc  tcctgcgtca  cccgattgcc  tccccgaaat  acttgcgcac     420
cgttttgtac  atatacttca  gtagtcggcc  atattggccg  aggcgatcgc  tttccaggct     480
tcctcgacga  cagttgtttg  cgaacgcctt  tgagtcgcct  catcttattg  atgaaagccc     540
catgatgatg  atggttacca  cggggaaaag  ttcccggttt  tccttgatgc  atcgatttcg     600
aagacgataa  accgcttcga  caggaggtcg  atgttttgtc  cgaattgagc  aggaagtcga     660
aacgaccgcc  ccggtagtac  tggcgggcgt  agtcagaaag  ttgtcgatat  tgaaatcttc     720
ccggctgact  ttgattcgcg  gtttttccagt  tccggccggt  aggtatcgcg  catgaattcg     780
taaacgtatt  gaagctcggc  gttatccctc  tgtccgaacc  gatcaggcgg  ataaggccga     840
gacagcgctg  ccgagctcgc  ccgattcggt  tttcgatatt  tttcctcttc  gcttttccag     900
agcgtcaaaa  gcagcgtttt  gatactgtct  tcttttcgac  gtcgaacacc  ccgtcatcgg     960
tataaaaagg  attgaacgaa  tcggctcctc  ttccgtatag  gtaaaataga  tgccgtcttc    1020  .
acctttcgtt  tccggtggat  gagcgaacaa  agtccctggt  aggagttgcc  cgtatcgaca    1080
gcaacacatg  cgttccctgt  tcgtaatact  gccgtacgag  atggttctga  aaaacgattt    1140
tcccgaaccg  gacggtccca  ggacaaattt  gttgcgttcg  tgataatccc  qcgtttcatc    1200
ggcaagtccg  aaatatcgag  atggacggtt  tgcccgtcag  gcggtcggac  agtttgatgc    1260
cgaagggtga  aagcagctgc  ggtagttcgt  ctcggccgta  aagaagcaga  gagccggctc    1320
gataaggtgt  agaatgtttc  ttcggaggga  aaatcgcccg  cattgccggg  cagcccgccc    1380
aatagagcgt  agccgtgtcc  gtcgtattgt  gacggggacg  gactccatca  aggccagcgc    1440
cgagcctaca  tcgttttttga  tctgccggag  tcttcccggt  cgtcgctcca  tgccagcaca    1500
ttgaaatgcg  cacggatgga  gcgagtccct  gggagtgcgc  aacgttcagg  tattcctcga    1560
tccactcgga  ttgatctgat  tggagcgaga  gaagcgtgca  agtgaaagca  tgtttcggcc    1620
tgtttctcga  agcgcttgag  attttcttcg  ctgtcgtcga  taaagagtac  tggttataga    1680
tatggttaca  cgggagcatc  agcccgacgg  gagcgcaaag  ctcagccggc  agtcgctgcg    1740
atcggtggag  agccgttcgt  aacgccgtcc  gttcgcacgg  cagcaggcag  atcgtcccgt    1800
atcggacaag  gtagcaggca  gaggatttga  tccccgatcc  gcacttcatc  ggcgccgagc    1860
cgaggtcttc  gagcgtgcct  gccgcatcgt  cgcgtaacga  gaggtaacgg  tgagcaagcc    1920
acgcttgtcg  tccgtgcctg  cgatctcatc  cgccgaaaga  gtctgaggcg  catatagccc    1980
gaatcgttga  tgatccgttc  gaactgatca  cggcctccag  aaatttcagg  acggcatccc    2040
gctcccggac  ttccttcgca  gaagggttcc  gcgacagagc  gtcgagaaat  cgcttcgttg    2100
cgccatggct  gtttcgtcgt  tttcgtcaga  cagaggtaga  cggaatggtg  caggaaggac    2160
gttcgttgaa  atgccgttcg  taagagcggt  cgaggaacga  gagatgtcct  tttccaactc    2220
cggacggtag  cttttttccgaa  taaaccagtc  ctgctgtgca  ggatgctgta  aacgggcaag    2280
accttcaccg  ccttgtgcca  ggcgcatgca  tcgccgcgta  ttcgggtgag  gtcacggtaa    2340
agagttcggg  cattcaagag  agaaagccac  ggtgatgtcg  gcatctttcg  atacgatgca    2400
gcgttctcga  tggccagcag  cgggaacttc  tcttccagtt  cgcatttctt  cggatatttc    2460
tcatggcgtc  ggttcgtttg  tcgttacagc  ccggacggaa  gaatacggcg  gacaggacgg    2520
cgagagagca  ggtaacgggg  atgccggcag  cggctccccg  tttcatcagc  ccgtgttctc    2580
cgtacttgcg  gttcatccga  acgtttgcca  caccacgagg  gtggcacccg  atacgcccat    2640
gcccagcaga  gatactggtt  catgccgcac  atgtagcaga  tgacgacaag  gatcacgtcg    2700
cg                                       •                              2702.
```

(2) INFORMATION FOR SEQ ID NO:597

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 762 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...762

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:597

```
aaatatgaag ttagcatcgc caactttctc ggaagtaagc catagcactc ctgtagatga    60
agtcaaatcc tcgattatct atccactggg aaaaatcttc cggaagcact gctggagtta   120
ttcataaaat tctacaagaa ggtatcttac gaagcctaat tctcccatgc tcaacgagga   180
atattatatt ccggcttggc tttcttgatg aagtcgccaa aggtgtcctt tgcagaacga   240
atacgctgaa agagcgatac gagctgatgc tgcgcaatcg aatcggcaca aaggcgagga   300
ctttatctac gaacagacca atggcagttt acatcgcctc agcgcagatt tacgctcaac   360
accatactcg tcttttatga gccgggatgc caacatgttc cgagctgatt cgccaactgc   420
atcaggatga ttggctgcgt atttggtaga atccaaacaa ctaagtattt tattcatata   480
tccggataat ataaaaatgc atgggtggcc ggtttgtccg attttcccga tttcgtggag   540
taggaatcaa tagcgatagc agtatcacag atcgacaact gtatgataca aagcctcacc   600
aacgatctat ctgcttgata atcacggata tgtaatttaa aagatgtaca aataggagtt   660
ataaaagagt atctgaaaga gaaaaagaat actctctgct tacgaagtat ttatgcatta   720
cagggaaaaa ataccgagaa tcttctttgc agctctgcag at                      762
```

(2) INFORMATION FOR SEQ ID NO:598

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 831 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...831

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:598

```
cccctcgcat catacgagtc aagaaaaact ttttacacaa cacctgatga tatgcccacc    60
ggggaaaccc acaagtctcc cccttcttcc tcgcatcggg actgtccgat gccgaagtct   120
tacatagccg agctacccac ggctcgacga actgactccc cgcgagcgcg aatcgctctg   180
gagcaagttt ttcgagagtt caaagatccc atcatcatca tcctgctcgt ggccatggtg   240
ctttctttgc cgtggcttgc tatcactact tcacgggcgg agagggcngt ctcctctttc   300
tggagccgac aggggtgctg ctcgctgtcg tattggccac ggggtagcct ttttcttcga   360
gatgaaatcc gagaaagagt tcgagatcct gatcaggtca atgaagacat attatataag   420
```

```
gtatatcgca acggcatgat cgcagggtgc tcaaaaaaga aatcgtcgta ggcgacctgg        480
tcgttctgga acgggagagc aaattccggc cgacggccga ctcatcgaag ccatctcgca        540
cagatcgacg aatccagcct gacgggcgaa cccgttgtaa acaaaaccct gaccggcagg        600
acttcgacgc ggaagccacc taccctccg attacattgc cgaggcacca ccattctgga         660
cggccactgc actttcaggg tggaaaggtg ggcgacgcca cggaatacgg acgggtattc        720
gagggtgccc gaccaacaac agcgtacaga cgccctgaa cagacagctc gaccatctgg         780
ccggctgatc acgaacgtca gctatagcat agcagccttg gtactcatcg g                831
```

(2) INFORMATION FOR SEQ ID NO:599

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 531 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...531

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:599

```
ggccgatacg gtggttatca ttgatggtac tattctcggc aaaccgcaaa cagagaagag        60
gccgctcgga tgctacgtac gttaagcggg cgtacgcaca ggtggtgacc ggtgtgtgca       120
ttagccaccg gtgggagaca agggcttctc gtgttccagt ctggtaacct ttgcgcatct       180
gagtgatgag gagatcatta ttatctcgaa cgctatcgcc cctatgacaa agccggttcg       240
tacggataca ggaatggata ggctacatcg ccattcagcg agtggagggt tcgtctacaa       300
tgtcatggga ctacccgttc atttgctcta taatgaactg aaaactttgg cgaatcaaat       360
taaagtctct atatttgcac cccgaagtgt aggagagata actaacaaaa caatataaga       420
gcaatgaaaa gaacatatca acctctaacc gtaagagact gaacaagcat ggctttcggt       480
ctcgtatggc acggcaaatg gccgtcgtgt attggccgtc gccgtgcaaa g                531
```

(2) INFORMATION FOR SEQ ID NO:600

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 570 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...570

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:600

```
atccccgaca tttttttgcag ataggacttt gaaagtaagg cctctttcta atgaaaaacc       60
tacctttaca gacgaaacgt ttcggggaaa atatgatgaa aagagagaat gaaaagaatc       120
```

```
aatatcacca tcggctttct ctttataact tcgtagtgat gtccgtattg ggatacccgc    180
gcgaaaggat agctccgacg gtgccgaccg gctggtgacg tatctgttgg tttgcgcttt    240
ggagcggtcg tactcatcct attacggtgg gtattgatcc ggcggtacaa gatggcgagc    300
gtcgccggca cgatatggaa cagtatgccc gatacgatga aaacccgacg aatagtcacc    360
taacgctaca gtgaagtatg acgaacacgg caagctctat ccttacatat tcaatcccat    420
tcttcgaccg gtcgtgtggg gggccgcagg atacgccctt tcaagggaat ggagcccgac    480
ccgacgaaaa atcggagaaa gctgggagaa tttcgcatgt gagcgaccat taattcggtg    540
ttggcaaacg ggccttcttt gccggtaaga                                     570
```

(2) INFORMATION FOR SEQ ID NO:601

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 780 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...780

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:601

```
cagaagaata aagggtaagg gtaggtcaaa aaaggtatta tagaatagac tccaaacgtt     60
ttgcacaaaa ccgacggagt tcgttcgttt gtaattgtca actccccttt caagctttcc    120
tgaaaaatga gttctatccc cttttctcaa tgcgatggct aatttgtaga gtgggtgcta    180
ttggttcaac atgtctatag actgatgaat aatgaagggg tatgatgggg cttttttaatc   240
atgaaatctg caagtttctt gctataaaga taagaaaact tgcagattta tcaaggtttt    300
cgcaaactaa tcagggcaac cgcatcaaat ctttagtagc ttttgagata gtctatattc    360
agagcagctt tgaacaacct cttccgtaag gaagtttgtc tttatgcccg gatacaatgg    420
ctaaagcaaa ctttctcaac ggtttagatt ggtggctgaa taatccttac gagctcgaca    480
agtatcctcc taaaggttac atccaaatgc caatggagtc gattctcaat tccccaatgc    540
ctcgaatata ttgtccgatt aactgacaat cctcgggtgg taaactgcga tataatactg    600
cctatctatg cgagtctctc cctctaaact actaatccac gctccacttg aattaaactt    660
ctcaagcctt gccattgact atattcccct cctcaaagac ctctgaagct agtaatgtgg    720
tataaagtcc tcttccaata cgaccatgat ctttctccaa ggttcataac gatgacacct    780
```

(2) INFORMATION FOR SEQ ID NO:602

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 1069 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature

(B) LOCATION 1...1069

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:602

```
tcgggcagta ttttcagagt gatttgttgc ttagtgaagg aagatattcg aagggccgat     60
acgacgagga aaatatgaag agtacggtag tgccctttgt aacggcatca tgctggcggt    120
agctgcgggg ttagccgaga gcaggggttg aggcggattt atatcgccaa tcacttcggc    180
gaccatgcca tatacccgat tgtcgtgcct catttattcg tccgatgacc gaagctgttc    240
ggtgcgtacc acgaacggcg tgctcataga agcaccttat actgatatta ctaaacagat    300
attgcacgga taggagcttc attgggtata gactatgccg agattggagt tgctacaagg    360
gggggggtgtt tcattgtggc gtttgtggta ccgtgtagag cgcagggagg ctttgcacga    420
tgccggcatt ccggatgcca cgagtacgaa ggttgagtat acttcattcg gcacgaagtt    480
atcaggcgcg tgaagaaat agggctgcta tccgatacgc atggctatat cgacgaaaat     540
accggataca tttcgccgat tgcgatgaga tttggcatgc cggtgacacg gctctgtaac    600
ggtagcggac tatttgtcgg gtttggctcc gctcgtctg tctatggcaa tatagacggg     660
caagacattc gtctgcagta tcccgagttc tgcgcttttg tgtggaagag gtgaaagtgt    720
ttatgacgca tatcggggat accccggtcg gtacgaacct cgtatatatc gaatgctcgt    780
gcagacccac ctcgtctttt tgtctgtggg catagtcata ttctcaaagc tattaccgat    840
aagaagttgg atatgctgca tctgaatccc ggagctgcag gtagtatggn tttcatgctg    900
ttcgtactct gatgcgcttc gtgaatcgat ggccgagata tacnggattt acaggtgata    960
gaattggccc gatcgataga tattaaagat gaaacatttc attcttcaaa gcttgcattt   1020
tcttctcccg ctggtangcg gatggatatc ctcttcgtgg tcgtggtgg                1069
```

(2) INFORMATION FOR SEQ ID NO:603

     (i) SEQUENCE CHARACTERISTICS:
          (A) LENGTH: 604 base pairs
          (B) TYPE: nucleic acid
          (C) STRANDEDNESS: double
          (D) TOPOLOGY: circular

     (ii) MOLECULE TYPE: DNA (genomic)

     (iii) HYPOTHETICAL: NO

     (iv) ANTI-SENSE: UNKNOWN

     (vi) ORIGINAL SOURCE:
          (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

     (ix) FEATURE:
          (A) NAME/KEY: misc_feature
          (B) LOCATION 1...604

     (xi) SEQUENCE DESCRIPTION: SEQ ID NO:603

```
ataggggaat gtttggcccg acgtatatca gcaggtgggc aatctgctcg agtcgtacgc     60
caatcgaacg acagagccat ccctcaagcc atcggccgtg cctcacctac ttcggcgaat    120
actggggcaa tcggctcttg gctgcagcgg tgctctgcac gagctgcggt acagtgaggt    180
gtataggact tgggaaaaga ggagagggct gaagactgac cctcaagtac tgccctatgg    240
catattaaca atagaatcat ggtagccagt atagataaag aagccgttgc cggctggagg    300
cagagatatt ccccggcacg atccacctga tcgacaaacc ccagccatcc ccgaagccat    360
aaggctgcta tcggccagtc gcacgatcgg ctcgacacgg agacccgccc ttctttcgtc    420
cgtggcgccc gtccgtccgt actctgatgc agatgtccac agaaacggac tgcttcctct    480
tccgactcaa atgatagata taccggagga actgcaacag ctactggaga atcccggcaa    540
ctcaaggtag gactgagcct gagcgatgac atgacggtga tcagacgggc aaaccgatcg    600
aacc                                                                  604
```

(2) INFORMATION FOR SEQ ID NO:604

     (i) SEQUENCE CHARACTERISTICS:
          (A) LENGTH: 4479 base pairs
          (B) TYPE: nucleic acid
          (C) STRANDEDNESS: double
          (D) TOPOLOGY: circular

(ii) MOLECULE TYPE: DNA (genomic)

(iii) HYPOTHETICAL: NO

(iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
    (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...4479

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:604

```
cagcagatcg gactgaagac caatctgctt tattggggta cgacgactcc aatgcaggat    60
tggagtttcg catgggaaag aagtggacac tcgatgttcg ggaggttaca accctttac   120
attcagccac catcgcaaac tcaagcatgg ctcgtggctc cggagcttcg ctattggacg   180
tgcgaagctt tctccgccac ttcttcgggc ttcacggcat cggaggtgag tacaatgtaa   240
atgattcgac atccccatcg gccggctcaa aaagctcaac aactaccgat acgaggatac   300
gccatcggtg caggtctgac ctatggctat cagtggctgc tggcaaaaga tggaacttgg   360
aggcatcgat cagcggagga ttcgtccact tcattatgac aaattcgaat gtgccaagtg   420
cggcaaaaag atcgcggaag gaagaacgac tacttcggtg tgacgaaagc cacactttcg   480
ctcatataca cattaagtaa taccttattt atacagacaa gctatatgaa acagagtcgt   540
atatcatcct gtcgtttctc ttcggaatgt ctacgcttgc cgtgacagcc agacccatct   600
cggggggcatt aaggtgagcg agaagcacgt ggtcaagaaa cgggacatac cgccaacgta   660
aagatggacc ttgatcttga cggccaaccg gatatgaaca gcaatctgct gatggtggtt   720
accccccatta ttcgtccaat acatcgaacg atcaagtcgc tctccgcccg ttcctcctga   780
tgggaacaga cgttatcgca tcatcgaccg tcgtatcgct ctcgataagc acccatctac   840
aatcagcccg acaccaagcc ttctgcgatg gtaaagcgtc gcacggcaag gaacagagca   900
tggactattc tgccgctact ccatataggc ctggatcgcg cactcatcaa tgattctatt   960
ggctgagaac tcgggctgtg cgactgccca ctcggatcag aagaaaccac acttacggac  1020
gacgctttgt gccactgtat gaagcggact atcaatacga gatcattgta cccgagggga  1080
gctgctgaaa aaacgcgaag agactctctc cgctcactta gcctatcggt agggaaatat  1140
gtggtcttgc ctcagttcga cggcaatccg gccgagtggc acgtatcgac agcaaactga  1200
aagaaatcgg aaacgatagc gatatatttt cgaaaagctc tccatggtag gctatgcttc  1260
gccggaaggt ggcgagaata caacgcgaag ctctccaagg atagggcgca ttcatttgca  1320
agcatctcgt taacaagtac cccatcctaa aaagtcgatt cgaatacgat tgaaagggca  1380
ggattgggca ggtctgcgtg cggctgtaac caagagcggg cctcgcaaaa ggatgccata  1440
ctggagatca tcgaccaaaa gccggtcggt agcgtacagc cgcactgcga gctatcgatg  1500
gcgggtctct ctatgccact tgctctcgga ctattacccc ccgcttcgcc gaagcgagct  1560
tacattccta tcgtggtcaa aggatttgag ttggacaaag cacgtgaaat tatcaagcac  1620
accctctcg tctgagtctg gcagaggttt acgccgtagc gcagagtatc cggaagggag  1680
ccacgaacgc tacgaaacgt ggacgatagc agagaaactt tcccgaaagc gatagagccg  1740
acagccaatg cggctataat agacttcgtg ccggcaggta tccgcaggct ctggctcgac  1800
tcgaagcacg caaagcgaac ccaaactatg gatgctgttg ggcttggcat atgcctacag  1860
cgaaaatggg ctgaagccga gagctatctt actcgcgctg cgcagcaagg cggcccggag  1920
cacaacacaa tctgaacgaa ctgcgacgct atatgcaaga aatctctaaa tggaaaaaga  1980
ttcttagaaa acaatattca cttttaaaaa aaaacgagat gaaaaaaaca aagttttct  2040
tgttgggact tgctgctctg ctatgacagc ttgtaacaaa gacaacgagg cagaaccgt  2100
tgtagaacta acgctactgt tagtttcata attaagagcg gtgagagccg cgctgtggcg  2160
atgaccttac agatgctaag atcacaaagc tcaccgccat ggtcttgcag gtcaagttca  2220
agaaggtatt aagacagtgg aagaggacgg cggatcctta aagtagaagg aattccgtgt  2280
aaatctggag ccaaccgtgt cctgtcgttg tagccaatca caattatgag cttaccggta  2340
aaagtttgaa tgggttgagg ccttgacgac ttcttgacag ctgaaaacca aaatgccaaa  2400
acttgatcat gacaggtaag tcagcagctt ttacaatcaa accgggctcc accactatgg  2460
ctatcctggt gggactgcat ccgacaacct tgtttctgcg gaactcctct tgccgttact  2520
cgcgtgcatg ccggtatctc attcgcagag tagaggtaaa tatggctaca cagtatcaaa  2580
actactattc ttttaaacag ctgacgctaa aatcgcagcc cttgtcgcaa agaaagattc  2640
taagatttcg gcaattcttt ggtctcaaac actaatgcat atttgtatgg agtccaacgc  2700
ctgccggtct ttacactccg gatgctgcag gagaaacata cgaatggagg cgtctttgaa  2760
tacgaattat gctgtaggtg ccggcttcta tgtctggaaa gtaaatatga tgcaagcaac  2820
gagcttcgtc cgacgatcct tttatctatg gaaagctgct cgataaggac ggcaaccctc  2880
tcacggaacc accttgacgg atgctataaa tgccggattc tgcgacggag atggcacgac  2940
tactatccgg tattggtgaa ctatgatggc aatggctaca tctattcagt gctattaccc  3000
aaggacaaaa caaaatcgtt cgcaacaacc actacaagtt tcgctgaaca tcaccggccc  3060
cggtacgaat actcctgaaa atcctcaccg gtacaagcca acctgaatgt tacttgccaa  3120
gttacacctt gggttgtgtt aatcaggctg ctacttggta atcgacccgt caaacgacta  3180
```

```
aaaaatttca tagtttgtct atatcggaat acagggagcg gggttcgctc cactcctgta    3240
ttcattctct ccaaatcaaa tagggaaatc ccaatcacca atcaagaatt attgttatga    3300
acgacgctaa gaaatatatc gtatcggtgc tgtcttactc gtggccggaa tgtttggcgg    3360
atgtatcaaa gaggactatt cgattgtccc cgtccgtttc gcctgaccgt cagggcttgg    3420
gatgccgata gcaagatatt accgaaaccg gagccgtgca gcgcgtcgtt attttcgttt    3480
cgacgaaacc ggccgccgca tcgaccgact gatgatggac gccgcacagt ggctgcacgc    3540
aaaccgatac cattggaata cgacggcccc actacgggtc tttcgtggca tgggccaacc    3600
ccgacgatca catgctggaa gaaacaccaa tgtgcaaaac gtcaaagact tattcttcag    3660
gctttcctct accgaggtat agcccaatcg cccggagacc tttttttccgg tgtactgacc    3720
tgccaataga gtacggctct atcgaacagg gtacagacca aactgtcgat atcaccgccg    3780
tacggcacag gtacatatca tcatacgcgg ctatcaagag tgctggaagc taatggcccc    3840
agacaactgc cagactatgc cgacatcctt tgggagaaac tcccgacact tataccggcc    3900
tggccgagct catcggcaat ccgtccaata ccgtcccgac ggacagatac aaaacgggga    3960
tttcatttcc ccatcttcag agtttatccc acacttgata ctactcctct gcatctcaac    4020
tctatgcata cggacaagaa ttgctgaata tcagcacagg ttcggatgag taccattcat    4080
acccgtcata ggcaaaatgc tcaatatcta catagactgc gtggagcaaa cctcaatgta    4140
ctcgtatccg tcacccttg ggacgagtgc aacaatatgc agaatactaa tccgacagct    4200
attatgaaaa tgaatatttc catcatcctt cgggactact tccacgcctt ctcctgttat    4260
tgctttaacg atggggcggt agcatgtacc aaggaagata atcccgatca gccacctcgg    4320
acgaagtggc aacagtaaag atgtcgcttg acgatgtcga atgcgaggcg gagacctcta    4380
cagtggagaa aatctgatca agaaagtgcg atattcgtct ttcgtgaagg gctaaacggc    4440
ctttgggttc tcgacaagca aaactatttg cttcggggc                           4479
```

(2) INFORMATION FOR SEQ ID NO:605

     (i) SEQUENCE CHARACTERISTICS:
       (A) LENGTH: 1156 base pairs
       (B) TYPE: nucleic acid
       (C) STRANDEDNESS: double
       (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
       (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
       (A) NAME/KEY: misc_feature
       (B) LOCATION 1...1156

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:605

```
ggcgattatt tccttcgcga caatttgtca cttggtatct ccgttgcacc ctgcgagtgg      60
gatggagaaa caattggacg gccaacgtta agttgtcgtt tgtcttcttt agaatctttg     120
tagaggacgt ttttcgcaa ttgcagtttt tcagtacacg tcgcttttct caaccgttga      180
gaaaatcttc gtcttgacga gggcgacgcc gtagatggct gagaggcgat ctcgcaggat     240
ggcggatcgt tgccgcgaag gctgacggta agcctgcaat tctcgacaaa atccgcgagc     300
ggatggaggc tccggcatct ttcaccagtc gcatcacttc tccagcaaag gatattcgaa     360
ggcgatagtc agttcttcat acaggatctc ttcttccggt cggctgcttc gagggcttcg     420
cgagccgctt cgcgataagc acgataagac cgctcgtgcc cagcttgaca cctccgaagt     480
agcgcactac gcgacgaata cctgcgtaag ccccaatgag gtgatctgcc cgaggatggt     540
ttgccggcag tccccgatgg ctctccgtcg tcattggatc gtgtgcgtcg cctttggctc     600
ccagcttgta tgcccagcat acatggcgtg catcgaatag cggcgacgca gatcggccac     660
aagcgacagg gcctcctctt ccgacttaca ggataggcga aagccaggaa gcggctgcgt     720
ttctccgtgt actgtcttcc gagggagcac tgatcgtgag gtaggaatct tcggccatgg     780
ttcaaggaga gcctcatctg taccttcctc ccgggcggca aacttttcgg acagacggag     840
aggagcgtac tcatttgttt gatactggcg agcgtctctt cgtcacttcc tttttctgca     900
agcgcagggt cagcagaccg tatatggcag taggcaagtc tctatctctc ccgtattgct     960
ccctgcactc ttggctctaa ctgtacgatg gcagggagca cctgatagta gagtccttga    1020
taaatcatcc tttggggtcc gccatcagtc cgtgagtgta tctcttccat ttgcatgagg    1080
ctatgcggac gatattgata tgcccctgct cgcgaacgcc cttaggtaag catcatcttc    1140
accagcttcg gcatac                                                     1156
```

(2) INFORMATION FOR SEQ ID NO:606

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 1076 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...1076

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:606

```
attctcttct tctctcttttc gaatggccag ggaaagtcag ncgaaaaagg aagggacttc     60
cctttaccct ttattttccg gctgcgtatc gnagggcact cgcgtcctgc attcagagct    120
tgaggttcat atccaccact tcttgtcttt gcggctgaaa atagcttcga taccgcctgc    180
cagatagtcg aaaggatctc aatgaaggga gaagcggctc cgagcatcac gaagttggat    240
gcacgacatt gcctacctca tcacgggcga tgctgtccgc atcgatcaga acgtatgagg    300
aagagattcg atcttggaga taactgacgt agtctcggga tagtcgggat gttgatgaac    360
ggaaccgtat tggtcactac ataaccgtca ggttcaaata aggaagatag cgcaatgctt    420
ccatcggctc cacggagagg aaagatccgc tccccgata gggatcaggt cagagtaaat    480
gggtgcatcc acaggcgcag aaaagactgt acatcaccac ctcgctggct catgccatgg    540
tttcggcctg cttcaaatac aaattgttgg tcagagcagc cgaaccgaag ctgctgcaat    600
ggacaaaatg ccttggcctc cgacaccggc caaaatatat ctgtttttcat ttctttattt    660
cctcctactt caatggttat tccttgcctt tgcacgtttg gcagctttg cgtcgcgagc    720
atgctttttgg atgcaacgcg acggggaatg atgacggata caccttcata gttgatttcc    780
tcccgatgat gctgcatagt tcgtcatgat tcttgggtac cggcaacagc tcctgatgtg    840
atcggggatc tactccgata ccgcgacaga tggcctctac ttgccgtatg cagacgaatg    900
ctgacctcgg tcatggagat ggattcattg tcgagataat caccgtaatg tgctattctc    960
attgatggca tcgagaagac cgttattccg aatgagtgaa agtagagtcg ccgattacag   1020
acacagccga acaagccggc atnggcagcc cttnggcatc gtgatagatg caccat       1076
```

(2) INFORMATION FOR SEQ ID NO:607

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 1015 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...1015

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:607 .

```
aactggaaaa tgaacaaaac cctccaagag gggcttgcat tggcaaaggg ttggacgcag     60
```

```
ctttgaaagg gcgtacgatc aactgtgacg tgattatcga accccattca tccatttggc    120
aagtattgcg gcagccatcg ataccaccgt atcggagttg cagctgaaaa ctgtgccgat    180
aaggagtcgg gtgcattacc ggagaggtct ctgctgctat ggtagccagt accggtgctc    240
ggtattgatt ataggacata gcgaacgccg tgcttactat catgaaacat ccccatcctg    300
atggagaagg tgaagttggc tttgtccaat ggcttgaccc ccatttctgt gttggcgaag    360
tcttggaaga gcgcgaagca ggcaagcact tcaggtagtc gctcgtcagg tggaagaagc    420
cctgtttact ttggatcaga cgactttgcc aaattgatcc ttgcttacga gcctgtgtgg    480
gccatcggta gggtaagacg gctacggcag accaagctca agagatgcat gcacatattg    540
taagagtata gccgctaaat atggaaaaga ggttgcgaac ggttgttcat tctctatgga    600
ggcagttgca atgcagccaa tgccaaagaa ctctttaccg tgcggatgta gatggtgggc    660
ttatcggagg ggcttctctc tcggtaacaa attcttgcct atcatcgaag cattctgaga    720
ttgcttattg tttcaaccct ttcgggcgag ttttatttca aaggagaaa cgaacgagat    780
gaaacgattt tctttttagt ctcctattgc tttcgttggt ttgccattcg tcacggaagc    840
tcaggtttcc acatcggctc atagcaaagc cccgatcagc atttcgaagc tctcagtgcg    900
gagcacgaag gagaaggcat catcaccatc ttcagcctgc atccgtaaag ctgccgtggg    960
caagtatccg gacgttggcc nttgatcgan ggcgagagca tatccgttga tccaa        1015
```

(2) INFORMATION FOR SEQ ID NO:608

    (i) SEQUENCE CHARACTERISTICS:
       (A) LENGTH: 577 base pairs
       (B) TYPE: nucleic acid
       (C) STRANDEDNESS: double
       (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
       (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
       (A) NAME/KEY: misc_feature
       (B) LOCATION 1...577

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:608

```
gatccggctg actatcgccc gctattatac gccttcggga cgtagcatca gaaaccttat     60
gcaaaaggga atttcaaagc atacgaacag gaattgatgg tcgcttcaaa cacggcgaat    120
ccatccacag cgacagcatc cgtttcccga ttctcttcgc tacaagactc tcgtcacggg    180
gcgcaccgtt tatggtgggg aggcattatg ccggatcttt tcatcccaac ggatacggcc    240
ttgttaacaa gctgcatcgc gagctgctga acaagggtat ctttaatcgg gctgactcaa    300
atatgtggat gcacatcgtc agaagctgcg ccaacgcttc cccacagaca gtcatacgcc    360
acgtttacat tcccgaagaa ctgactgaaa gctgaaagca tttgccgaag ctgagaaat    420
cacatggagc accgaacttt ngctcaagcc gaagagctta tcaagtgtca gctccatgcc    480
tatatcgcac tgatattctg gggagaacga cttcttctat ttcttcaatc gcatggatag    540
gatatataaa gcactcgatc tctcatgatc cgacgaa                              577
```

(2) INFORMATION FOR SEQ ID NO:609

    (i) SEQUENCE CHARACTERISTICS:
       (A) LENGTH: 850 base pairs
       (B) TYPE: nucleic acid
       (C) STRANDEDNESS: double
       (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:

(A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...850

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:609

```
cgaagccgtc gtgatgcagg cacagctgga aatggaagcc aagcgtttgc caaggcgaag      60
tctatcctcg aaaaatttat tgccaagagt actcctcaca gtattggttg gcacgaggtt     120
tcatcctctt gtccgatatt tataagaaga aggggatacg tttacggcaa ggcagtattt     180
ggaaagcttg gaaaagacta tcctaatcat gaggatgaca ttcacgaaca gatagcccaa     240
cggctgaata atcttctgta cgattcatca ctctgagttg gaaataatga acagatcatg     300
aaatatcaat tatatacggc cgtcataatg gctctctctg tatatccgtt tgcggtcaaa     360
ccccacgaaa tacagaaacc aaacgccccg accgctgcgc agggagctta ctatcgttaa     420
tgaccagact gtggagatgg acatgcggat ccgcttccgg ctgcatacaa ggccatcgaa     480
cctcgattaa acctttccgt ccggaatata acaagcgtac attcggattt gtccctgaat     540
ttcctcttca ggcaggaaca atcttccgaa tatcctgccg acggaaggca tatgaagcac     600
cgggggtacc tgaatatcgg tatcggccat acgctaacca gcgaatggat gccggctatc     660
gtctgataga tgcagagcag gagagatgaa tcttttcctc tcctatcgtg ggatgaaatt     720
ggctttcaat accgggactt cgacggcgac agaaaggata gacgaaatga tggcaggaat     780
ggacacgagc agcgcaggcc ttcctttgtg cttgctaccg gcttggatta ttcaaccatt     840
atttcaatac                                                            850
```

(2) INFORMATION FOR SEQ ID NO:610

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 680 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular   :

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...680

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:610

```
aggatccccc gccatgcggc gatcttatcc tcggctccta tgggcatcac tttgcatgtg      60
tgactgggta cataaggaac gcaaggaaat tattgacagg ggctgcaaaa aaggctgtgc     120
tcctcatacg agatcgcact gtcgccctct tgaaagagac aatcgcccaa ctggacgaat     180
acttctctca caagaggaga ctttcgacat ccccctgctt atggcaggaa cggagtttca     240
gcaaaggtat ggggcgagct gctgaatatc ccctacggca ccacgatctc atacccactc     300
ttgcacgacg aataggaaac cccaaagccg tgagggccgt agccgtgcca acggagccaa     360
tcccatatcc atcctcgtgc cgtgccatcg ggaattggaa gcgacaatac gctgacaggt     420
tacggtgggg gattggacaa aaggaattcc tgctttcgtc atgaaatgag tctgccggtc     480
taaagccttg aagcctctcg aaggctattt atatttgagt atatttgcaa gcataaaaca     540
gttatataaa aacaaagtag aatatggatt tcatctttct tcaaggccga ccacaagccg     600
gaggcctgtt cggaggctca agccagatga ttctggtctc gtgctcatgg tagtaatctt     660
ttacttcttc atgatcaggc                                                 680
```

(2) INFORMATION FOR SEQ ID NO:611

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 1992 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double

      (D) TOPOLOGY: circular

  (ii) MOLECULE TYPE: DNA (genomic)

  (iii) HYPOTHETICAL: NO

  (iv) ANTI-SENSE: UNKNOWN

  (vi) ORIGINAL SOURCE:
      (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

  (ix) FEATURE:
      (A) NAME/KEY: misc_feature
      (B) LOCATION 1...1992

  (xi) SEQUENCE DESCRIPTION: SEQ ID NO:611

```
gcaaagtctc caattcggca tcattcatag cctcggcaag ggcatagcgt tcttggtact     60
ctcaaaagct ttccagccgc tccagtcttg tttggccttg ctctggctac gatctgacgc    120
atcatagaac gggccgaatt gcctcccaag ggctgaagct gtcaaaatcc atcgccaata    180
taaagtaggc atagaaacga cggaggcaac cagattactt tgcagatccg tctcattata    240
ttcgagggat cgaactggtt gtattcgaag ttcagttcct gatctcgcca aatagctgag    300
gagaaaaata ggaggaattg taaataggqc gacgagaagt aacaagagtt cggccttgta    360
ttgactttcg tctttcactt cggtaaggtt gaggaaaaag gtgcagtcga tacgctctgc    420
aaaactgaat gtggccgttg tcatcgagtc aggttgagga gatctgagag ctgacgctcc    480
aatgtcttga tgtctccgca ttggcattac tgccgagacg ttcgctattg atagttacct    540
ggcattcaac tcctgactta cagcagagcc gtatagaaaa acaggcagtc cacaggcccc    600
accacaatct ccttctcatc ccaatccgat tatatagcca caatatcttc ggccacctcg    660
accttgcttt tgagcggata gtccgaggtc ggccttcact gtcgaatatg gtgatcttat    720
tcgtacctac tccaatccgg ctcccgcatc ggaaagcgaa ttcagtacta tcgcatccaa    780
gtgctggctt tcatcttgcg catagcctct tgctccccac tgtccgtctc caagcaaaac    840
ccaccaaccg ctgtcctgca cgtttgagtg ctccgagcgt agcgctatat ccggattagc    900
agtcaagcga agatcgaagt cgcccttggt cctcgtttca tcttttctc tgcctgctct     960
gccggacgat agtcagccac gctgcggaca agacggttat gtcggccttt tcaaaaggtt   1020
tccgacaggt tcgagcatct ctacggcact ttccacatcg atacggtcta tcccttcgca   1080
gttgtctgca tagtggtagg gccggtgaca agcgtaaccg aagccccaat tcggccaaac   1140
gttctgctat gcagaagccc atccttccgg aagagtgttg ccgagaaaac gtacaggatc   1200
gagtttctcg tatgtagggc cggcttaacc aatgctctct tcccaaggag gggcttacaa   1260
tcgttctcct tgaaaaagcc tccaatatct ccacaatgca ctccggctct tccatccgcc   1320
ccttcctacc aaatgactgg ccaattcgcc ttcacccggc tctatgatat gatgccataa   1380
gagcgtagta tctccatatt gtgctgcgta ctcggatgtc gaacatgtcc agatccatag   1440
ccggagccac gaatacggga gccttggcgg aaggtaagtg gttaccaaca tattgtcggc   1500
tatgccatgt gccatcttgc tatcgtagag gctgtggccg gagctatcag catagcatcc   1560
gcccagagct gagatccaca tggctgttcc atgtaccatc ccgtccggag aaaaattgct   1620
gatgacaggc ttggaagtca gagccgagag ggtgatggga gtaatgactc cttgccggca   1680
ggagtaatga ctatttgcac ttcagcctcc tttttatgag caggcgggtc aaaacggcag   1740
ccttgtaggc tgcgatactc cccggacacc gaggacgatg tgcttaccgg ccaaagatga   1800
tttcatctgc acgagttctc ttgtacttgg tttatttggt ctccggattg ttcagagaca   1860
tagcaggcga gtaaattctt gctttggatt cagcgtaaaa tccgcatcca tatccagccg   1920
taataaccgg aatctgtacg caatacatcc agagctttac gccgcgatac ttgccgaaat   1980
gatgataacg ta                                                        1992
```

(2) INFORMATION FOR SEQ ID NO:612

    (i) SEQUENCE CHARACTERISTICS:
      (A) LENGTH: 569 base pairs
      (B) TYPE: nucleic acid
      (C) STRANDEDNESS: double
      (D) TOPOLOGY: circular

  (ii) MOLECULE TYPE: DNA (genomic)

  (iii) HYPOTHETICAL: NO

  (iv) ANTI-SENSE: UNKNOWN

  (vi) ORIGINAL SOURCE:

(A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...569

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:612

```
ggatcccctt gcataacagt tgtttgcttc gtgcctatct gtgaatggag cgcgcaacgg      60
aaataccgga ctttccatac agagaggaaa gggtagaaca gcaaaaagca gggtgaaaaa     120
tagtcgtttc atcttttgt cttatttttg tggaaattat gattgataag cccttctttt     180
cccttcatcg taaatgatag tcgtcccata aaggggggga taagggatga ctaaataatc     240
tttgcatcac ggtctccata tctttccaaa ctaaaggcaa tggaatttta ttgcctttct     300
tcgattcttt gctgttttta gtgttatgat tatagcttcc tgcaaggaaa cacatttttt     360
gcttttcaca aggctgataa gtcttgattt tttgttttag aaatttattt cttcttggat     420
tttgctcgtt ggcatttat gtactctgtg ataccacttt atatcggtct gaatctctgc     480
ctgtgtggat ccagaaaggt ctgattttct atataatcgt cccttaaaaa acccgaatta     540
gccgagatgc catgggaata atggatatc                                       569
```

(2) INFORMATION FOR SEQ ID NO:613

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 528 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...528

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:613

```
cggcgatctc gccggtttgt gtcaggtcga gcctgcctgt ggcaacggta tacgcgtatt      60
ctccgtaacg cgcttcataa agagcaggat ggccaaaaca gtcctatctc tatggcaacg     120
gtcaagtcga ggatgacggt aagcaagaag taaccagcat gacgaggcta tcgctgcgag     180
ggccgcgacc gatattgcca ccgaacgcca tccgctcata ttgtaggata ctatgatcag     240
tactcggcca aacaagccat cgggatgtat gccgtcagag gcccgaggaa cagcggatca     300
gcagtaacac gaaggcgtgt atgatccctg caatgggaga gcgccgccgt tgttgatgtt     360
ggtcatcgta cgcgctatgg ctccggtgac ggaataccac cgaagaacgg aaccactata     420
ttggccgcac cctgagcgat agctcggtat tgctgttgtg cttttttccc tatcacacca     480
tcgggctacg ttggctgaca agcagagatt cgatagcttc caacaggg                 528
```

(2) INFORMATION FOR SEQ ID NO:614

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 653 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
    (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...653

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:614

```
tccgtgtcga tgcgatccat tcgaattttg gccggagtaa cctctccgat atcttcttca    60
tggcagccat atagttgttg atcttggtgc cacctccatg agaataatgc cggcgccgat   120
atcttcaagg aggcctgaga ggcgtagatg ttgaggtagt tggctgtgat ttcgtccatg   180
cgagccttgg ccaggcattg acttcggagg agcggaactc tctttcggaa aatttgtcgg   240
caaagtcatg cggaatgatc cgttggactt attgtcgttg atcatcgaca cgtgttgagc   300
ttcatgttct ccgcctcctg ttctgtcagt cgcaggctgg tcaatcgcgt gtgacgttat   360
aacctcccat cggaagtacg cgaagcatgg ccacagcctg tttttataga tagataccga   420
tgtacagccg gcacctatat tacgtagcaa catcccaatg tcaagctcgt cgtccgaaga   480
gcaatacctg gcttcgcaaa gcggtgtgac gaggatgcct gtcaagcgca atcccagact   540
tcttctatgg cgatgcggat attctgcttt accgaacggc gagcagtgtc aattggaagc   600
cgggcttcaa gcttcatgac aaaatacttc cttggccgta tcttcctgtt tcc          653
```

(2) INFORMATION FOR SEQ ID NO:615

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 626 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

  (ii) MOLECULE TYPE: DNA (genomic)

 (iii) HYPOTHETICAL: NO

  (iv) ANTI-SENSE: UNKNOWN

  (vi) ORIGINAL SOURCE:
      (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

  (ix) FEATURE:
      (A) NAME/KEY: misc_feature
      (B) LOCATION 1...626

  (xi) SEQUENCE DESCRIPTION: SEQ ID NO:615

```
cggtatgggg caaggtgccc aaacgtcagg gtacaggtta cgctttcgaa atactgccgg    60
agcacgaccg aaacaggacg tcggctttaa cggacttaga cggcagagga aaaagacttc   120
cctacatata cagagtacat atcccgctgg cctcgatcgt atcgccggat gttttgaacc   180
aatggagtac agatccttca gtccgatcaa cgatccggga ggggataact tccaccacta   240
tagagggcag attacgatga ggcacggaag tctattctcg atcgttataa gcagataacg   300
gagtggaagg caactcggcc gaagccacta acaacattac cggtacaacg tgtccagccg   360
tttggtgccg gatgtggaag acatcaatca ggcaatacgc tcaacgagat agagaagtat   420
ttccagtacc cgtgtggagc tcatccctct aaaatggttg tggggcaaaa ctatattgtc   480
gattctcgca caaagaggta gagttgcgca acggtaaaaa ggaaacgata acctggtata   540
gttcaaagtc cccgtgcggg aattcgagag aaagatagga ggcattacga cttcaagacc   600
attcgattca tgcgtggtct acctga                                        626
```

(2) INFORMATION FOR SEQ ID NO:616

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 595 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

  (ii) MOLECULE TYPE: DNA (genomic)

(iii) HYPOTHETICAL: NO

(iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
    (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...595

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:616

```
cgtcccttag caggctgagg cactccggta aaaccggcac cgatcggctt cgatatgcaa      60
gcaaacgtct gaagcctctg ccagcccctt ggcatgtcga gcaaaccgaa acccgtaata     120
tcggtggcac cccttatccc gtatttcgca tcaactccgc ccctgctcta ttgagcaggc     180
acatctgccc gatggcgcct cataaacttc actgccgata agccccaaac ggtgggcagc     240
catcgtacgc ctattcccag cggtttggtt aggacgaggc attgccctgc acgtcgccgg     300
catttgtgac cagatgctcc ggatgcacta tgcctgtaac ggcagtccgt acttaggtat     360
gggatcgtct atcgtatgcc ctcccatcgt aaggcaccac tctcgtctat cgtctgctgt     420
cctccacgga gaatagtncg caagacctct acgggaatcc cttcggaggg gaacatggtc     480
agattgagta caacagcggt cgcccttcca tggcatacac attcgagaga gcattggcac     540
agctatgcga ccgaaggtat aaggatcgga caaaccgcgg gaagaaatcg gggta          595
```

(2) INFORMATION FOR SEQ ID NO:617

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 556 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...556

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:617

```
ggatcagtac cgatgaagaa gagataagtc gacttgagca agaagtcttg ccttttataa      60
agagattgag gcccaagcat cgttgctgac cgaagaacca ttcgggcagc ctccgctttg     120
gaaacttctt tgtgcgaatc cttacgcagc tcaatatgcc tcatgtccgt tttgtcgttg     180
atattcgctc gacagatacg gccctcacgg agcagacaag gtcgtttttt tgttttcggc     240
gaatagcaga tggagccgga gccggtatcg gagattgcct caggaggaga gattctcgcc     300
tgatgttgtg tctgaaagct ctcattgcag acaagcgttc tttccggcca tcgttttcga     360
tgagatagat accggcgtat cgggtgaagt ggtgaccgta tgggagagat tatggctcat     420
atgggacaag gtatgcaagt gtcnccatca cgcatctgcc caaatagcag cccgagggga     480
acggcactac ttgtctataa agatgaaaca ggcgaacggg cacgcacctt cattcgtgat     540
gactccgaag agcgaa                                                     556
```

(2) INFORMATION FOR SEQ ID NO:618

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 311 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

(ii) MOLECULE TYPE: DNA (genomic)

(iii) HYPOTHETICAL: NO

(iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
    (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...311

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:618

```
gccttaacat tgaacaatct aggtctatta tacagcaata acaatgagca aagcaagcga    60
aagactgcca tcaagaggcc ttggtgataa gaagagaatc gtaaaaaaaa gtcctcaggc   120
ctacaatcaa gacttggcta tgacattaac aatttaggcc ttttactcgg caaaaacaat   180
gaattaaagc aagcgaagat tgctatcaag aggctttggt gaaatacaga gagcttgcaa   240
agaaaatcct caagtctata acccggagtt agcctcagta ttgaacaatc tggggtctta   300
ctcaacgata a                                                        311
```

(2) INFORMATION FOR SEQ ID NO:619

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 566 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...566

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:619

```
ggcaaccact gccttcggat agcgttgcag tacttctgcc gtattcttgg aagcggattg    60
ataaagcgga agtgagccaa agccactttc ttgccggctt gcgcatacgc tccattgtct   120
catagaggtg gccataggta ccgccccacc gatgatcaaa agctcggcat cgtctttatc   180
gccgtgtact tccaaacagg aatatcttgg gcaatagctt gaaccttggc ttcacgcgta   240
gcgacatctt ggcgtgattc tccggattgg tgctgatggc accggtcaca tagtcttctc   300
caaaccgccc aaacggtgct ggaagccttc ctgtccgggg atacccaata gcgaacgtgg   360
gtctcttcat ttctgaagta aggtctccat ttgcttcgcc cttatactga tccacgtagg   420
gaggacggat atcgggatat gttggggatc ggggattctc catgcagagg agccgttagc   480
gatgaaagca ccgttagcag gataccggtg tcatatgctc aaagctatct tacatgcccg   540
aaagcagaag tcgaagcagt ctgacg                                        566
```

(2) INFORMATION FOR SEQ ID NO:620

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 458 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

(iii) HYPOTHETICAL: NO

(iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
    (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...458

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:620

```
ggagaagcct cccccgatgg agttcgagac aatggttact tctactacag atggcgatag      60
cccttatcgg aggagtactt atgacccttt tgatgctgtg gccaaaggtc ccttcgtgac     120
catgttcagt cgcaatagcc ccgaactgtg gactttact atagtatcgt cccccttgttc    180
gtcttcatgc tctttgtct gtcttcgaac tctacgccac acaactgatg cgaatagccg      240
tgcccagctg atccgcgagg tagtgctcag gctgatgctg atcgtcgttt atctctctat     300
gcctttcgat gggtcaagtc tggaagtttt catcgccata tttttgcagc ctatgccgca     360
tgtatgctct tgctgttggc ttatatccgg cgatcggcaa ggtcaatctt cgtcacaatc     420
ggggctttct gacaccggag cgaagcgcaa ttttctcc                            458
```

(2) INFORMATION FOR SEQ ID NO:621

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 1626 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

   (ii) MOLECULE TYPE: DNA (genomic)

  (iii) HYPOTHETICAL: NO

   (iv) ANTI-SENSE: UNKNOWN

   (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

   (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...1626

   (xi) SEQUENCE DESCRIPTION: SEQ ID NO:621

```
ggcatccgtc ggacgaagaa gccaagtccg tggtcaagaa tacatggttc atctcggtgg      60
taatagttgc gagcaaatcg tattttgtct caagcgtatg ccgagccgtg taagaagcat     120
gtggacaaca acttcaaatc cgctgccaag gtctgtgtat ccgaatttct tgctgcacgc     180
gaaaaactca ttctcttatc aaagaggcca agctgatcgt gtccaacgaa acggatgaga     240
tcttgatccg atgacttacc gcggcaagga catcaagaaa gagctaaagc agctcgcaag     300
acacagctta gccgcattca gcagggggcg agcagtctga agattctctc gtctatctga     360
atctcttgca ggagtcgcag cagttggtga attattggac gatctgatcc acgccacgga     420
gaagctgttc gacccccgtag ccggatcggc acggacgaag aatttttcaa ctgacggccg     480
atagctctgt ttttcctcac tgtgcatccc cctgataaag ggtcttccga atacattaaa     540
ggatgtaata acggaggatc agggataaat aattgataaa agcttgtgaa gagaaaaaaa    600
atgccttact ttgcaacccg attatgaccg ctttatgtgc tacaagcagt cctaacgaac     660
tggaacgata ataaactaat aacgaatagc aatgtcaaag atttgtcaga ttaccggcaa     720
aaaggcaatg gttggaacaa cgtttctcac tccaagagaa ggacaaaacg agtattcgat     780
gtcacttgtt cagaaagaag ttctattggg tagaacagga ttgctgggtt gtttgaggat     840
atcggctgcc gggctgcgcc tcatcaacaa aatcggtctc gagctgccat caagcgcgcg     900
gccgagaagg gcttcttaaa cgcataatca aggagaattc tgtcatggca aagaaagtaa     960
aaggcaatcg ggtgcaggtt tccttgaatg caccgagcat aaggagagtg gtatgccggg    1020
tatttctcgt acatcaccac caagaataga aaaaatacga ctcagcgtct ggaactcaga    1080
agtacaaccc catcctgaga cgtatgaccc ttcataagga aatcaaaaat aaagaggaga    1140
tcagacaatg gcaaaaaaat cggttgcaac atttaaaaag gtgatggccg tacctactcc    1200
aaggtaatca agatggtcaa gtctctaaga cgggtgccta taccttccag gaagaaatgg    1260
tcccgaacga agcttaaaag acttctttaa gtaaggtttt ttccttttga ataatataga    1320
```

```
gtggataagc attctcagtg aagcccttc tattacacta tagggctttt attttatcg    1380
atcgatcaag attgacaatg aaaacaaaca cttattccct gtatttgtct ctatctctct   1440
tgtcttttg tcgttctttc cagcaaaggc caggctatac acccgaggat tgaagcaggg    1500
ctgggtttgt tgaaggaggg ctgcctcttt tctctatacc ttccataggc tggcttttttc  1560
gaatgacgga aaactctgta tcgaaccatc ggtcggctat tatctatggg tagctccaag   1620
catcag                                                              1626
```

(2) INFORMATION FOR SEQ ID NO:622

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 2704 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...2704

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:622

```
gtccatttgc attggcctcg gtaacaaaag ctccgttggt gtctttcacg tattcagacc    60
ccactcctgt gcttcgtcgt atttgttgct ggccagggaa gaccggcttg gagctggaag   120
gacttgtatg cgaccttacc ttccagatga gaccgaatac tttggctccg ctaccgttga   180
tacgcgtgta gcgtttatgc catcgtgctg atcaggctgc tcctcgttgg tgaatacatc   240
cagcaacgag tatagaagcc ttccacaagg aagttggtct ggacgttacc gaaagatgat   300
acatatcggc actcaaactg aatgcatgag aaatttcagg cttaggttcg gatcgttgaa   360
tactttctgt gcctcaccgc ctacaacccc tagtgcaagt cttcatcgaa tacctgcggt   420
gcgcggaacc cttttgcata ttagcgcgca ggttgatgtc cggattcacg ttgaaacgca   480
gtgtggtacg ggactcagaa tcatatcctt gacttcgcta tgcttgtcca agcgagcgca   540
acaaggatgc tccatctgtc attttccat tcgttctgac cgaataggtg tagttgttga    600
tattctgatc caattcggga tagaggggaa tggtattcca ttggcatcct cgccggtctg   660
ccatgaaagg atgggcatca cgtcatgagt tcatcacgcg tatattcggc tccgaacaaa   720
agttgcgaag gcatgggagg aatttgtcca agtcgtagct gtactggata ccgcccatat   780
atgtttgcct ttggtcacgc cataattatt gccgtattga tcttgaggga taggtagcct   840
tccgtaccac cggggtggcc attgacgtca atctctccga tactccgtaa tagctcttgc   900
gatttacgat ctgtccggaa gtataagcct gaagtggtgt ttatagttgg aagagaagag   960
atcgtatttc aagtttccgc aaatacgcta tggtcagttt gttcagctac acccactacg   1020
tgaggaggca atcgatacga tcgccaccac ggcggaattc actgatcgtg tgaaactccc   1080
cgtcaatttg ctgtagtcgc tcaagcgcaa ataagaatgc gctcccacga gcgggcatct   1140
attttaccca attcggaata accgtcattg ttagcaccca atggttgcgg taacgagcct   1200
gcccgaatac catggcaccg gcacgttgtc atcgctgacg atggaggcat tgaagttcgt   1260
gttgttatcc agctgctgaa accggtaaag ctcagagatt cattgaatgt gaaagaattg   1320
tgaaaggttc cttggtgatg atattcacca ctccggcaat agcagaagaa cctacaaggc   1380
cgatcctcca ccacgtacta cctccacacg ttcgatcata tggcagggat ctgctccaga   1440
ccgtaaacac cggcaagggc actcatgatg gacggctgtc gatgaggatc tgtgcataac   1500
gaccatccag tccattgatc gaacttgatt gaaaccacag ttctgacagt tgttctctac   1560
acgaactccg gctggaatga caagccttga gccaggttag aagcattgac ttgcgagaga   1620
cttttttcgtt caatacattt accagagtag gagcaagacg gcgaaggtca gttcgcggtt   1680
ggccgaaatc acgacttcgt ccagattgat ggcatctctt ctgcttcgaa attcacctcg   1740
atagtcttgt cctttttctac gcggctacgc gctcctggct cttatagccc atgccacgca   1800
taatcaaagt gattcacccg gacgcaagtt acgaagatag tagtgcccgg ttgcatctgt   1860
agtgtaccaa aggtagtgcc tttgatagca atagtgatac cgacaaggtg tcaccgtct    1920
tgctgtcttt gacgtgaccg atgatattgg catcggtcgg tacttgaact cagtgtctgt   1980
cgctgcgttc agcccactga acgcaatgac gccagcagga taaaaaagat tttttttccg   2040
atcatgtttt tattgtatag gtgggaatag gttccctaaa gcatttcttc cgattccgcc   2100
caaaaaataa agaggatatc gaatagaatc tgctcatcat ataaaagaga ggcgaccccca  2160
tattgttcgc ctctctttgt attcttagtt tatttttgga ctctccttac ttttttcccgg   2220
```

```
gcttgatccc gataagttcc atctcgaacg tcaggtagag aacggttcga tggtatagtt    2280
gccggtctcc ccataagcca gctctgtggg attaccacgc gaactttctg accgaccttc    2340
atgagttgga gctctccgtc cagcctttaa tcacaccggt aacggcaaat tcgattcctt    2400
ctcgtttttg tcgaactctt taccatcgac cagagtaccc acatacttga acgtacagta    2460
tcggccaaag agggagtagc tcccgtacct tcctgaagat cttgtatgcc agaccacttg    2520
tcgtaacagt tacaccatct tctttttttaa ggtatcgatg tattcattac ccttttcgat    2580
gttctggcca aactgctcat attgttttct cgctgctttt tggcttggat tcgttgcatg    2640
aaagccgtgc atctgcaggc ttcatggcga tagatacggt gtcttaagaa gagccgggac    2700
cgag                                                                 2704
```

(2) INFORMATION FOR SEQ ID NO:623

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 564 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...564

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:623

```
atccccagcg catcagccgg atcgatgttg ggatcacgta taatatcttg agatgccact     60
gggcattatc gatccaattc ttcaaaaaca aataatgccg atcgtttgag gccgatatgg    120
attgttgcac ggtgcgtcta cgctgtcgtg acgttatagg cctgaatagc ctcgccgaaa    180
atcctattgc acaactgctg atagtcataa ttattattgc cgcttaattt gtcaaaatta    240
taatgtatgc ggacaaagat atataaaaaa ccgattggcg aactctgaga attagtcctc    300
caatcggttt tgtaaattgc taaaaagcaa caataatttt aatagtcttt tttgactctc    360
ttttttattg cttatcagtt gccttttcgt gctcttggcg tgcgggcaat ttcctgcttc    420
agctttgcct ttgccttcgc agatttgtgg ccgtgcttgc tcttgcactc gccttttttct    480
gacttgtggc gtcactttt ttgcagtctt tggatttgtc cttgctacaa tctttgcgtg    540
gcatccttgg ccttatcctt acag                                           564
```

(2) INFORMATION FOR SEQ ID NO:624

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 426 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...426

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:624

```
tagaggatcc ccgcttatgg gacgaatgat gggtagtatc atcaagggga tccctccaag      60
atgcgtcccg tggcagatga gttggccgct ctcggacggt cagccagatc gggttcctta     120
cttattgttt gcggctcttt cgcgagtgta tataagtaga gtaggggttg caaaactgaa     180
ctacctctct cccgagaaga atccttcgtc gatatgctca gtggaggcat tacgggacag     240
aacatcgacc ggtgatggag gaggtggagc tggctatccg tcatattcgt cagatggaaa     300
cggtcggatg atttttttcg atctcctcct ccgccttacg ccctcttgc ccctgctctt      360
cgtgccaaag gccttaaata agcaaccctg tcttccccct ttatacgggc ttgtacatag      420
agggag                                                                426
```

(2) INFORMATION FOR SEQ ID NO:625

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 549 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...549

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:625

```
ggacgtattc cgctcaatga aacggatcgc tcgcccaaag cgagtgtaga ttttccatgc      60
gtgggactcc tacggatata gagaagctgc agcgcaactt atggaaatgg cttctcagct     120
caatatggat atttcgttcc agcgggaagc atgttccgtc gcatgcgtcg tctcatttgc     180
ttcgatatgg actctacctg attcagacag aggtcataga cgaactggct atcagagccg     240
gagtagcgat cgggtaaaag ccattactga aagtgccatg agaggcgaaa tcgatttacc     300
gaaagcttcc gccagcgagt ggctctgctg aaaggacttg atgatctgtg atgcaggaga     360
ttgccgaaag tcttcctatt accgaaggtg tgagcggcta atgaagatcc tcaagatggt     420
aggcttcaag atcgctatcc ttcgggggga ttcatgtact tcggcaacta tctagccaag     480
aagttcggaa cgactatgtc tatgccaatg aattggaagt aaaagacggt aagctcacgg     540
ccgatatgt                                                             549
```

(2) INFORMATION FOR SEQ ID NO:626

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 524 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...524

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:626

```
gggcttcctc ttttcgtgaa acccaatgtg ggaggttcca gcatcgcgat accaaggtgg      60
tggaagctgc acagctcctt ccggcaatag aacaagcctc tcggaaggcg aagaggtaat     120
gatagagcgt ctgatatgtg gtaccgagtt acctgcgggg cattcctcag aaaaaaagaa     180
gtggtcgcat tgcctgtaca gaagttgtcg cacataatga gtttttcgac ttcgatgcca     240
aatacacgga gctgtagagg aaatcacacc ggcgagaatc agcgatgaag ccaccgattg     300
atacagacca tgactgcgcg catatacgag cttctcaacg ctcgggcatc atacgtgtgg     360
actatattca tcgaagcgga tggtattccc acctgctgga agtgaacacg acaccgggca     420
tgacccctac gagctttatn cccagcaggt tcgagcagcc cggaatggat atgaaagaag     480
gtgctttgca tattcattcg ggatggactt gaatgagacc caat                      524
```

(2) INFORMATION FOR SEQ ID NO:627

   (i) SEQUENCE CHARACTERISTICS:
      (A) LENGTH: 1165 base pairs
      (B) TYPE: nucleic acid
      (C) STRANDEDNESS: double
      (D) TOPOLOGY: circular

  (ii) MOLECULE TYPE: DNA (genomic)

 (iii) HYPOTHETICAL: NO

  (iv) ANTI-SENSE: UNKNOWN

  (vi) ORIGINAL SOURCE:
      (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

, (ix) FEATURE:
      (A) NAME/KEY: misc_feature
      (B) LOCATION 1...1165

  (xi) SEQUENCE DESCRIPTION: SEQ ID NO:627

```
ggaagttggt cagaactcca ctgataatgg agtccatctc tgccaattcg attcgtgttg      60
gctgtttact gctgcaatag agtcatactg cattttcact ctttataggc actggagttt     120
tttccacatg ataccaaggc aagagttgcg ctgtggcgat aaacagtttc ttcttcatgt     180
tcgtaatact tttattgcgt gacacttcat tcattcttaa cttattgctt ctcttctttt     240
ctcccttcgg ggcggctcca cccacgatga gaacgaattc tccccttgga gggtgttttc     300
gaagtgagcc agtaattccg cgagtgttcc gcggatcacc tctcgtggag tttgctcagc     360
tcccggcatg cagcagctgg tcgatcgaga ccaaagtctc cacaaattgg gtcagagtcc     420
tgagcacccg atgggcgac tataaaatat catcgtccgg agctcttcgg ccaattcttt      480
cattcgagtt ggcggccttt cttgacaggc agaaaacctt cgaaaacaaa cctgtcggcg     540
ggagtccgct tgctaccaaa gccggaatca atgctgtggg tccgggcaac attctaccac     600
tacacccaac tcggcacatg ctctgacaag caaaaaacgg ggtcgctgat cccgggagtt     660
ccggcgtcgg agatcaaagc tatgcgtcac ctccggatat ccgttcggcc aatgacttgg     720
ccgtacgatg ttcgtgaatt tatgatggct ctggagcgga cagtgaatgt cgtaatggtg     780
gagcatacac tgctggtacg cgtgtcctct gccaaaatca ggtctgcttc gcgagtacct     840
tcaaggctct caaggtaata tcctccaaat tgccgatagg agcggcacga ctgtcaaacg     900
tccttccatc gcaaatccta cggttcagtt cttctacgga agaaatccga cactacttcc     960
gcaaagtcat ttaccaccgg tcctctgcct cccattgcat ccgctgatgc aaatagatca    1020
tagcttcagc gctgacgaca gcaatccgag atgggcagag atgtctcgca taagcttgca    1080
tcgtcttgaa acaactcccg tctaaagcga aaaaaatcca acgtagaact atcttctgca    1140
aatcgaagcc tgcaggagag gtctc                                          1165
```

(2) INFORMATION FOR SEQ ID NO:628

   (i) SEQUENCE CHARACTERISTICS:
      (A) LENGTH: 1008 base pairs
      (B) TYPE: nucleic acid
      (C) STRANDEDNESS: double
      (D) TOPOLOGY: circular

  (ii) MOLECULE TYPE: DNA (genomic)

 (iii) HYPOTHETICAL: NO

(iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
    (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...1008

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:628

```
gatctatctt gatgtccaag tggagttctc ccgcgtttgt tggcctgagg atcacctctg      60
ggcatatttt tccggcatcg gaatagagtg cttcggaggc tggtcatgca ggtcttcgcc     120
gaagttgcgg cgaaactcgt ccactctttt tttcagcttc tctgccggag cttcgttatc     180
ggcatagagg atattcccac ccgtcgatct ccctccgtaa ggcgaagggc caaccatctg     240
ctattggcgt atcgggatga aagagccgga tggattcggc caaagaatcg atcccgtatc     300
tatttcagta ccgatacttg tcagtcgatg cggagtacag cgaatatccc ttgggccacc     360
tcggacaggg ccgacaggag atcggatatg cctctcccga acgtgcactg gctcctacga     420
cagggatgcc cagcctgcgc ggagacctct caggtcgatc tctacgccgt tccgttcggc     480
ttcgtccatt gattggcaca taggacggca cgatccgtta tttcgaggat ttgcaggata     540
gattcatatt ccgctccagt cgggtagcat ctgccacgat gagggtaaat cgggcttgcc     600
gaagagaatg aagtcgcgag cgatctcctc atcctcgagg tagaaaggag agaataggtg     660
cccggaagat ccactatctt gtatgagagc cggcatacga gaatgcacct tcggctttct     720
ctaccgtttt cccggccagt tgcccgtatg ttgtttgagc ccggtcaggg cattgaatac     780
cgtatcttgc ctgtattggg attgccggca agggcgatgg tgaagtcgta tcgtccgcat     840
cggtgcccat gcgccggagt ttatttccgc tgtgtgcggg gcacccgttg caggctgaag     900
aagtggtagc actctttttc atcattcgat tgaagttggt ctgaacgtta ggtcttttac     960
ctggatataa ggatataacg gcttgatcgc gtcgcaaggc gatggccg              1008
```

(2) INFORMATION FOR SEQ ID NO:629

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 499 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...499

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:629

```
cggcatcgtt ctgtagcgac aggtacgacc atacggctac ggggatagtt tggctttgca      60
ccaaattctc ttttaatcat tcgactgacc tctcgataat gaggagaagc catttcatga     120
accgcacata tccgaaccgg ctttcaggag taagatatac ggtgaagtat atggcttctt     180
gctcaatgaa atccaatttg ttacaaatat actgacagac agtgattcta ccaaagcatc     240
cattcatata tttccggctg tgagtgcaac acaataaaca aaggccggtt agagtcgaag     300
ccggatattg gagcggattt tagtagtttt gcgctccgtt agaatactga atataaggat     360
gtttcaagat ccaagaaacg atcgtcaagc ccgacctctt cgacaagtat tttgtctgcg     420
attatgctac gtgtcagggg attgctgcgt ggaaggagaa agcggtgctc ctctcgaagc     480
gggtgaaagc gattttgct                                                  499
```

(2) INFORMATION FOR SEQ ID NO:630

    (i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 539 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: double
(D) TOPOLOGY: circular

(ii) MOLECULE TYPE: DNA (genomic)

(iii) HYPOTHETICAL: NO

(iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
(A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
(A) NAME/KEY: misc_feature
(B) LOCATION 1...539

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:630

```
ggcaatgaca atttgcaaac gataacagtg cgtcgcaata tggccaaatc agcttggcca      60
tgaataccgc caagctgaca gaggtggagt actctcttat aacacctttg acaaaggcac     120
cttggctcca ttcgacccct ccgaaacaat ccagacttag cattcaaaaa agattttgtg     180
accgagccgg ccggagtgat tttgataatc agaaagggtt caaacctgtc ggtcctgaga     240
atttctttat ggtttcgagc gtaaaaattc agttattgct gcgggagaac aaattcttgc     300
ctgatcataa aaggcaaata tcaaggtagt aatgcctttt cttctacaag atagactttg     360
tccatcagga cgacaagacc aagcgttacg actcatacgc aatcacttct ataaggtgac     420
gatcaatgat gtatttaaag cggatttccc acaatcgagg cggctctttc aggtgctgct     480
gcgaacaaca agctctctcc gaggagctgc aaatgtaccc cgtctttctc tgacggaaa      539
```

(2) INFORMATION FOR SEQ ID NO:631

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 529 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: double
(D) TOPOLOGY: circular

(ii) MOLECULE TYPE: DNA (genomic)

(iii) HYPOTHETICAL: NO

(iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
(A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
(A) NAME/KEY: misc_feature
(B) LOCATION 1...529

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:631

```
gggttcaaag agatattggt accggccgat aatttccggc aggaggatgc ggccgcttcg      60
gtattcggct cgtgccggtc agaaaggtgg aggaagcctc cgccatctgt tctcgaaagg     120
aagagaatag aaagaacgga gaaaacacta tcaggagaga gctacaattt ccaaaaacat     180
acaagtaata atgaaaagaa caaactattc cgtatcggga tacttgccat cgttgccctc     240
ttgctacagg atgcaagggg agccgatacg cattttatca ccgatgcaga cttcgcaaac     300
aggtgcaaga agatctgaga gtaaaacgcg aagctctatc cgaggcaatc tcttcgaagt     360
gctggagcgc gattcgctcc gtaccgaaga gccgaagcac tggagttcct gtatgcctac     420
atgacttctg ccggacatcg tgactactcg ggcgacttct acttgcagaa tgtacgcgag     480
agcttccgcg aagaagaaga atgtcgtggg gtaaggaagt gcccgactg               529
```

(2) INFORMATION FOR SEQ ID NO:632

(i) SEQUENCE CHARACTERISTICS:

```
(A)  LENGTH: 3949 base pairs
(B)  TYPE: nucleic acid
(C)  STRANDEDNESS: double
(D)  TOPOLOGY: circular
```

(ii) MOLECULE TYPE: DNA (genomic)

(iii) HYPOTHETICAL: NO

(iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
    (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...3949

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:632

```
cggagcgcag  ccgatagccc  gcttcaccca  gaaactggat  cagcccaatc  cgtaaccttt    60
gtaggcaaag  gcaaattgga  tgagatacgc  gcctatgtca  ggagaacgag  atcggcatgg   120
tggtgttcga  cgacgaactg  tcgcccagca  gctgcgcaac  atcgaaaaag  aacttcagac   180
caagatcctc  gatcgtcggg  tcttatcctc  gatatattcg  cccgacgggc  acagacggct   240
catgcaaaac  gcaggtagaa  ctggcgcagt  accagtatat  gctgcctcga  ctgaggggct   300
atggacccac  ctcgaaaggc  agcgaggcgg  tgtcggcatg  agagtccggg  agaaaagcag   360
ttggagacag  accgccgtat  cgtctttgga  caaatagctc  ggctcaaaga  agaactaagg   420
gacatagaca  agcagaaatc  ctgcagcgca  agaaccgtgg  caagatggta  cgcgttgctt   480
tggtcggcta  acgaatgtcg  ggaagagtac  gttgatgaat  gtcctctcca  aaagtgaggc   540
ttcgccgaaa  acaagctgtt  tgccacgttg  aatacgacgg  tgcgcaagtg  atcatagaca   600
atttgccttt  cttgctgagc  gatacggtcg  ggtttatcgc  aagctgccca  cacagttggt   660
cgaatctttc  aaaagtacac  ttgatgggtg  cgagaggcgg  atttgttggt  gcacgtggtg   720
gatatgtcgc  atccgcattc  gaagagcaaa  tagaggtggt  gaaccagact  ctggcggaga   780
taacgcagga  gaagaaaagc  cgatgcttct  tctcttcaac  aagatcgatg  cgtctctttc   840
acacccaaag  acgaagacga  ccttactccc  cgaacaaaag  agacataagt  gccgaggagc   900
tgcaacagac  ctggatggcc  aaactcggga  agactgcctg  ttcgtctcgg  cgaagaaagg   960
caccgggatg  gatgctctga  agctcttttg  tacgagagag  ctaaggcaat  ccatatcacg  1020
cgcttcccca  caatgacttc  ctgttccagg  actattcgga  ggagatggaa  taagctgtct  1080
cttgggaagt  atgtgaaaat  tcctttagtg  gttctccatc  ggcttgccga  aattctctat  1140
ctttgataga  ttgttgatct  tgagaccata  agttttgtgg  ctctgtgcat  cgacgacttc  1200
gatcatcaat  aacaataaac  gatcatagca  ctgtggacgt  atctgcatat  ccttttttc   1260
gtcgcgatat  gagtggctct  cctttaacga  acgcgtgttg  atggaggctg  ccgaccggac  1320
tttccggttt  acgacaggat  caagttcctg  tccatcttct  cttccaatct  gggagttct   1380
ataccgtacg  ggtggcctat  catcaggccg  tcctacagaa  aggcgcgaca  ggagcgaggc  1440
cgaagaggat  tccgatgcgg  atgctcatat  ctgcaagcta  ttcgggagac  tgtaatcaga  1500
caggacgaac  tgtattatcg  attttttacg  atcagatcct  gcccaccttg  gaggaacncg  1560
gtatccgatg  cgtacggcat  gcccccactc  atccggatca  taaagcctac  ctgcgtcttt  1620
cttccacgag  gagattttcc  ctctgctcta  tccgatgctg  ttgctgcgag  caaggtgcgt  1680
acatttatcc  gttcaggtag  ggtgtatctg  gctgtcggct  caaagaaaaa  gagacggacg  1740
aggcctacag  ctatgcactg  ctcatgtgcc  taccgacggc  cttcctcgct  tcgtagagct  1800
gccacggctc  cagccgacac  attttattac  tactcttttc  tggaagatat  tatcaaagag  1860
cactggatgt  agtcttcccc  ggatacgagg  tgatggacag  ctattcgatc  aagtgtcgcg  1920
cgatgccgat  ttgctgttgg  atgcacagcg  tcctgaagat  tgcccggaga  gatccgcaag  1980
aaggtgaaga  ctcgcaagct  cggtgctcca  cgcgattcat  gtatgacggg  cgcatgcccg  2040
acgaggtgct  gcgatacact  gcagttcgtg  cgacatcgat  ccggaggagg  cgattcggag  2100
tggaaacacg  tcaatctgca  agatctggct  atgctgccca  atccgtttgc  ccccagctgg  2160
agacactcac  gccggagcct  ctcctctcga  agcatttgga  gcaggcccct  ctctgatgga  2220
aggcattcgt  aggaaggact  acctgattca  tgtgcttact  atacgtatga  ctatgtcgtg  2280
cgcctgctga  tggaagcggc  cattcaccgg  atgtgtcgga  aatacgcctt  acacagtatc  2340
gcgtagctga  aattcgtcca  ttatcagtgc  attggaagcg  gctgcacaga  gtggaaagaa  2400
gtatctgtct  tcgtggagtt  gaaagcccga  ttcgatgagg  aaaacaactt  cgtttgtcag  2460
agcgtatgcg  ccgttcgggg  attcggatcg  tttacagtag  cccgggctga  aagtccatgc  2520
caaaacggct  ctcatcctct  atcatacacg  gccggtgaac  gtccgcaagg  catcgctttg  2580
ctctctacgg  ggaatttaat  gagaccactg  ctcgcattta  ctccgacact  acgctgatga  2640
ctgccatacg  gacattgtgc  atgatgtgta  ccgccttttc  cgcattttgg  acggaatccc  2700
gaaccggcac  gtttcagtcg  tctgctcgtg  gctcgctaca  acatggtgaa  gccattacca  2760
acctgatcga  acgcgagata  gaaaatgtga  agctggtaag  cgtggctata  tgctcctgaa  2820
gatgaacggc  ctgcaggaca  agatgtcatc  acacagctct  atcgggcttc  cgaagccggt  2880
```

```
gtggagatcg actgatcgtg gagggtatct gctgtttggt acccgatatg ccacagagtc    2940
caatatacgt gtcactcgat tggtggatat gtatttggag catagccgtt ctggtgcttc    3000
cacaacgggg ggaaagaaga ggtattcatc tcttcggcga ctggatgaag cgcaatctat    3060
acaaccgcat cgagactgcc tgccctggct ggatcctgct ttacgaagag agattatcga    3120
catattggag atccagttcg cgacaatatc aaggcttgcc ggatcgattc ttctctcaac    3180
aacattacaa acacaatagc gatgagaaac cggtgcgagc acaagctgct atctccgcta    3240
tctcaaaggc aaagaagagg ccactcctgc tgcaaaataa atgtgaataa gacccgtttc    3300
ctccgtatcc tgctgtcact ggcagccgtt tgttctcgtc tctattcctc gtggctcaac    3360
gacattcgga agcttcgagc gtggcatcgt gacaaattca gcctttttcat tcattacggc    3420
ttctacagtg gcttggaggg gtttggcaag gcaaaccagt gaagaacgga tatagcgaaa    3480
gatctactct ttcggaatac gcgacatgaa gcaatacgag ccggtggcaa gcggttccgc    3540
cccgacagat gggatgccga tgccatagta gccttagtcg gaaagcaggg atgaagagta    3600
tcgtgtttac ttccaagcat cacgatgctt ctgcatgtat ggctcggctg agactccatt    3660
caatatagtg gaggcactcc ttcgcgtcgc gatgtgatga aggaattgag cgatgcttgt    3720
gagcttcggg tatgaagttc ggcgtttact tctctcttat tgattggcat ttccggaagc    3780
caatccgatc agcgatcaca atgctgatcg gattactccg gccatcacca atacaatatg    3840
cgtcaggtca gagagatcct cacgggctac gccctgtcag cgagttgtgg ttcgatatgg    3900
gatcgcttac gccgaagcag gtgaagagtt gtattgtttg gtgcatgag                 3949
```

(2) INFORMATION FOR SEQ ID NO:633

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 2096 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...2096

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:633

```
tccgaactta tggctctgag gtaactccac ttgtcgccca cagtgcggag agtcttctct      60
ttaccatcga aaacgatggt cagaggttcg gccagaggtt cttctcatcc accatcaggg     120
taatgagtac atagtccttt tccagcagct ctttactgta ggatcgatcc aaacggcatt     180
ctccatcttt ctacagtcac gcagccgtga cctgagaagt cgaggaggac aggtttgttc     240
tcctgcgagc aaaagccata ccggcctcat aatccgtaaa gtgacgatga acttgccact     300
atagagattg aaatcctgcg tgtggagcgg cggagcaaaa gcattacagc cttgagcgga     360
gcccccaca aaccggggat catatataca gcaaagccaa agagacagta gccatcataa      420
agcgcggcac agagagatgt gccattcgct atcatggctg aaacggatcc atcccaagag     480
atagcaaccg gcagagcgaa aatgacaatc cagagagcga ggaaagtctc acgatcgaga     540
tatgccagcc atatgccaag tctgccacgg agaggaactt gagagcaaag ccaattcgag     600
gaagccgagt accaccttca ccatattcaa ccatcctcgc tcttaggcat accctgcaac     660
cagctgggga agaccgcaaa aagagtaagg gcaaagccaa tgaagtggca aagccaagca     720
tgcccatggc cggagcagtt tggagccggc tgtagcagcc tgtaccaaga gcgtaccgat     780
aatagaccgg tacaagagaa ggacaccaaa gccagcgtaa aggccataaa gaaatactga     840
gcaaaccggt cgtagagtcc gccttgctgt ccagcttgtt agccaagatg acggcaacac     900
cagctcgaat gctccgaaga aagagatagc gagactacca acagcaggaa gaatatgatg     960
ttgaagaccg cattcgtggc aaactgttca gagaattgac accgaaaata cccgtaatga    1020
gcaagccgac actacgtaga taacgatgat ggaagctccg taggtaaagg catctctccg    1080
gctttcttct tgtccttatt acgcttaagg aagaagctca ccgtcatggg atcataggcc    1140
atacgcaagg agtaagcaat gcaacaaaac cgtagagaaa ccatagagga aaatcttcca    1200
cggagcactc tctgcctgct tgagctatca tcaccgtatg cacgcaactc gctaacaacc    1260
ggtgtccaca agtcgccttg gacgaaagag cttcggcagc atcggtctgc gatgtagtat    1320
ccgtgcggtc tcggcagcaa ccgcttcagc agcttcagct tcggtatcag gactgcagcc    1380
ttgctcttga tcatcgaagc atcgaaagag aagtcgctcg ttcgggtggc agacagtttt    1440
catcattaca agccatgaag cgaacaccac tttgatagag aatttggcag ggtccgtcac    1500
```

```
ctgaattttc tgacggaaaa gacagtcttc tcgtaccatc tcagatccat ttcgaactgc    1560
ttgtcgtacg gttgacagga gctttgtcag gaatagcctt accgacaagt ttggctccgt    1620
cattttatcg aacaggaatt ctgtggatgt agggccatcc tcgggcgatt ttggtcataa    1680
aggtgccatc cgggtttgat cgtggccgta aacacaatgt tttctcaggc gtgtcgctat    1740
cctgaagaga ggttttccaa acgatacatc cttgataatc tgagcagatg ccccgatggg    1800
caacatagag agaacagtag ggctaaagct accgtccatt tgctgtttct gtggttcttg    1860
ttgtcattat tatatgttgg attattaaaa ttagtcagct acctatttgg acgttttttt    1920
gtctttgata ttgtttggtc tgctgcagtg ccttcttcga atgtatcagg cggcgaaaga    1980
gtttgggcaa aggcaactta tattcctgct atctcccgtt tcaggatgac ggaatacgaa    2040
tcgcgttccc tgtagggcag acagtccaga tggcggaaag aactaccctg cctcaa        2096
```

(2) INFORMATION FOR SEQ ID NO:634

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 650 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...650

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:634

```
tagaggatcc cctgtagatt tctcgtcatt gtatagctgt ctgaaaggga taccgctgtc     60
atgttctgtg aagtggctaa ttctccggcc aaagtaataa gcagtttaca aaggatacca    120
aaggagaagg aaagccttgg ctaaaagtgc atacgtgcag gaaagcttct acattgggag    180
ggaaaatctc gatgcttggt ttcgatcaag agcaaaaacg aactcatcgc agatgttgtg    240
gcattctgca gtctccggcc aagaacgtta ttgcatcttt gcagtcagca ggtcaacgat    300
ccatggtgtg ttgaagacct tggaagaaaa ataattcaac agttaattga aaacttttaa    360
tactcaaaaa taaaatggca gacattaaag ctttgctgaa caactggtta acttgacagt    420
aaaagaagtt agcgaactcg cactatcctg aaagaagaat atggcattga gccggcagct    480
gctgctgttg tgtagccgct gctcctggtg ctgccggtgc tgcagctgaa gaggagaaac    540
ttctttcgac gtagttctta agagtgctgg agctgcaaaa ttgcaggtgt gaaagctgta    600
aagaacaatg cggtcttggc ctgaaagaag caaaggactc gtggacgcag               650
```

(2) INFORMATION FOR SEQ ID NO:635

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 623 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...623

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:635

```
ggccagttcg atattgcttc ggtctgtcat gctctctgcg acaagctgac tatcggcatc     60
cgcatatcta tggcaatgta caggtggaga atgctgccaa gtggtacgca actgggagca    120
actcaaactc cgcgaaaagg atgggaaaag tccgtcctct ccggcgtgcc gaagtctctc    180
cctgctttgg tgaagactat cggatgcagg agaaagccgc aggcgtaggt ttcgactggg    240
agcaagggag caggtatggc cgaaagttga agaagagctg aacgaagtcc gagggctatt    300
gtcagtgaag atcccgatgc catggaagca gagttcggcg actgctcttc gccgtggtga    360
atgccgctcg tctctacggt atcaatccgg atatgctctc gaacgtacca atagaaaatt    420
cgacagccgt ttctcctatg tgagcagcgt gccaaacagc agggcaaagc tctcagagat    480
atgaccctct ggagatggat gcgctgtgga atgaggcaaa acagaaagga ctctgacctg    540
ttccaagcgg aaaaagctat ctttgtaagc acgatttagc attattacat aatgaacgaa    600
gacattaaaa agaatacctc ggc                                           623
```

(2) INFORMATION FOR SEQ ID NO:636

    (i) SEQUENCE CHARACTERISTICS:
       (A) LENGTH: 753 base pairs
       (B) TYPE: nucleic acid
       (C) STRANDEDNESS: double
       (D) TOPOLOGY: circular

   (ii) MOLECULE TYPE: DNA (genomic)

  (iii) HYPOTHETICAL: NO

   (iv) ANTI-SENSE: UNKNOWN

   (vi) ORIGINAL SOURCE:
       (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

   (ix) FEATURE:
       (A) NAME/KEY: misc_feature
       (B) LOCATION 1...753

   (xi) SEQUENCE DESCRIPTION: SEQ ID NO:636

```
agcggggcca aacctttct ccaccccttgc caaaaaccag cttcccttt ctaagttttc     60
tattatagca gaaataaatg cattatttc cagctccaag attattccgg gtataatggt    120
tgttgctttt attgttttca tataagatcg accactctat ctgcggataa tttgctctta    180
gcgtaatctg taaattgagc ttacaccaac cttttatcct gtaggctgca atggaggaac    240
aatttgagt ctgcactcag gattatattg attgattgct ttgcaaagat tttcgttcca    300
agaacatttg attgataata ttctttcttt gttgttcgtg aaattgtgcc gccaagtgaa    360
caattacatc ttgtcctttt acaaaatctt cggagattcc aagttcgata aatctccttt    420
gataactttg actttatctt cattgtttct atattgctac tttcccttgt caaacaggtt    480
attggtgtgt tgtttttgac aataattcaa cgagtctgtt tccaagaaaa cctgttcccc    540
ggttatgcca attcttatca tttttatatc attcataaaa tatttcttat tattatcgnt    600
ctctccaaag agtgtagtag gcgtacngat atccatgcgc angaaagcaa gtatgggttt    660
ttcggcctga ttgggaatcg gagactaact aaaagaactt tttctttttt gtgttttcgt    720
ctgaaattcg agaaagctct aaagactacc tat                                753
```

(2) INFORMATION FOR SEQ ID NO:637

    (i) SEQUENCE CHARACTERISTICS:
       (A) LENGTH: 855 base pairs
       (B) TYPE: nucleic acid
       (C) STRANDEDNESS: double
       (D) TOPOLOGY: circular

   (ii) MOLECULE TYPE: DNA (genomic)

  (iii) HYPOTHETICAL: NO

   (iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
    (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...855

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:637

```
tcagtccatg aagaataggc agcggatcca ctccgacaaa cgaacggcat catcttgtaa      60
gatgggacca tccacgtagt cgttcgggtt cggccgatag taacgatcag cttttttctgc    120
tcctcggcac aagcctccat cacataggca gcgtactgat ataagtaaag aagcgagtcc     180
cgacatcctg catatcaata gcagcacatc gacgtcggcc aacattcgag gagtaggttt     240
cttgttttgc cgtagagcga aacgataggg attcccgtcc tgacatcccg ttcaccttga     300
ccgttgcccc ggcatcggca tctccacgga agccgtgttc aggcctaaga tcttgacgac     360
attgactccc tgccgaagca gattgtcaag aaatgttccc gctccgtccc caccacgctc     420
gtagcattag ccaccagtgc ccacgcttgt ctctgagaag aggcaggagc agctctgtcc     480
tctctgcacc acaactaccc gtacctcctc tcttgggggtt gcgaccgaaa tctcctgctc    540
gaatgagcag tctgactccc gacttcctca ctcctcgacg aatgcgctcc cctgcaactt     600
ggcaaccggt ataggccgaa aacgacatta gcccgctatg caggctaatg cgatagaata     660
tttccggaaa aagcgaggga tcatttcctt cgtttactcg tcgatgatct tccaagaaag     720
ccttcaatcc actatcgtaa gagggtgctt gagcagaccc tttgatggcg ttgagcgggc     780
aagtgccaca tcggcaccgg ctttcgaggc actgaataat gtgctgcgta tggggggatgc    840
tggcagcaag tacct                                                      855
```

(2) INFORMATION FOR SEQ ID NO:638

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 687 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...687

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:638

```
gaagccaaca actgttatgc aagcaattcc tgaatacgat gataccggtg actatccaaa      60
agtcaaagta ttgcctgcga gtaaactccc aaacgaaact ccggtttgcg tcataactca     120
gacaagcaaa gggattaaca ttaaggtagg actgttgatg cagtcgatga tgaaaaccta     180
aacggacgaa taataggaat ttttacccca atgatactct tggccccgaa tcggaagaga     240
aactaaaagg ttgggggttt tactctccaa agcctccgaa gatttcgatc ttcgcaaacc     300
aatgaaatat ccatcgactt aactgttttc aaagatttgg ctgttcaatc accgaaaagc     360
attgtaattt atacggtgag acaatctcat acgtgaaaaa atgacactga aaaagggaga     420
cttaatgacc aagccatttt taaaggcctc tataaggtaa aagaataaga gcatggcaaa     480
gcgaataatc cgaggatagg agacgttttt gaagtccaat tagataattg caagaagtat     540
ttcagtacat cgcaaatgac atgacacagc tcaacagtag cgtaatacta cttttgtgga     600
agaataccccc ttggactgtt ctccgatctt agaaaattta cccgcgggta agggtgattt     660
tatgcacata cagtcctccg atgggga                                         687
```

(2) INFORMATION FOR SEQ ID NO:639

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 3856 base pairs
        (B) TYPE: nucleic acid

(C) STRANDEDNESS: double
(D) TOPOLOGY: circular

(ii) MOLECULE TYPE: DNA (genomic)

(iii) HYPOTHETICAL: NO

(iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
(A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
(A) NAME/KEY: misc_feature
(B) LOCATION 1...3856

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:639

```
gccgtttgct gttttcgtat ttttgtaaag tggcagccgt tttattgatc ccacctgggc      60
ccggacatcc tcgttatgtt tatcgaaaag ttccactaac tgtttaatgt atccgtctgt     120
ccgcagtatt ccgatttgat cctctccgcg tcaaatcatc tactgttact tccaaacgtt     180
tgtaaatggt cagaattcag ccctgatttc ttcgatcttt cgattgactt caagtgcttc     240
tgcacatgtc ctttgacttt ttcttttct gaatcccata attgggcatt gacaacaggc      300
ctgtagaccc cagcgacaaa cgctccttat tcagataaat ccgatgagga tgggcgtctt     360
gccttctttg ttgatgtaat tgctgcgcaa gtaaaaactg aacgaaattg actcttcatt     420
ttgctccaaa attagtgtaa catacggcta caaagttcga catatgattt tgaaacagag     480
caatttgtca tcgtctaaac atcgtcttaa cgtcgtctgt ggttacaatt tttcagccct     540
ttgttttttg taaccaaaat ggaaccaccg gaggcatatt tacggaatta cgcctattcc     600
gaacctcatc cgacgtgtgg ggtggcgaca aagaaaagcg ccttaattcg ttggaattaa     660
gacgcttttg gattcgtttc taaaatgctt cagatgacct atagcctatc tttcagctat     720
ttagcggtat ggacggactc gaacccgcga ccccctgcgt gacaggcagg tattctaacc     780
agctaactac cacaccgttg cgaatgaatt tacctctttc agcgctgcaa agaaagtttt     840
ttcctcaata tgcaatagtc atcaaaaaat ctgcacattc catcaccagt gcaacattga     900
gtagctaagt tagttctaaa acttggcatg ggttagatgc cctagccctt ttcgaggtct     960
tcgattaagt ttgtcttgta tcttccacaa tgtggagatg taacttatgt tttttaggta    1020
ttaggatgta ataacagttt ggcaagggat agatcgagag gagtagtcaa tttgatattt    1080
cgatattacc gacaatcaat gccaccggtc ggccaaaatg gtgttcaata ccgaacaatc    1140
atcggtaaaa tactcttcat agggttgccg ataggctctc gaagccattc gctccgaaag    1200
gtctgtggag tttgtaccgt gacgtccgac tcctgtccac tgcataattg ccatcagtgg    1260
cataatagcg aagcattcgg tcatagggcg acaaggagcg acagcccct tcaactctgc    1320
aagtcgaaac aggcatcgat agtttcagca ctgaccaaag gacgtacccc gtatgaacag    1380
caaccaaaac accatcaggg acaacctgca atccattccg acagaggcga aacgtgtatt    1440
tccacctgca accactcgat gagagaccga aagtcatact tccggcacaa ttcctgccaa    1500
taagcatgat gatctgtggc aataccaata caatagcatc gacatgaggg gcaaagcgat    1560
tcagcgtagc atcagcaccg gtagaccggc caaaagcaaa aactgttttg gccgatcgcc    1620
cccatacgta gcccatgacc accggctacg atcagagcat agcgttttgc tccatgagag    1680
tttggccatg agttcttcga tctgcttgtc ggctatgtca gtttctcacg acagaaacca    1740
atcagagcaa tagcctcttc ggccgcttgg tcagctcgtc cacatccggg ctttcatgtt    1800
cgatgacacg aacatttctt cgaggcgtct catggcctcc gtataagtct tattctcact    1860
caaataatgg caaaaataag gatttgcaga agaaaccgta aacgaatcct cggatcaaac    1920
tctaaaaaca gatgagaaat actagaagta gccgaatgag aaaaaaactc gcccctaagg    1980
gaggaggttt ccgttttgt gaactcaccc aataaatcca aagatcaatt ccggtattgc    2040
aagaccatct taacctgttt tcggcccta tatttcgatc tcaccacaag aaaaaactaa    2100
aaaaataatc atcacggcat taacataaaa gcccactatc atgttttaa caaaaactat    2160
tattattgta gtagacaaat acaagacact attatgatta atataatacg cgactaacta    2220
tcctgacatt tcttggatgt gtctttatgc tctcgccaaa gagattaatg tagattccct    2280
tttccaaata gcggccgacc ggatctttct gccacggaaa agaaaaaaag gtatgaggag    2340
atgggcaaac agtcgaactg catcaacaag tcggtagtgc agccgatgca tattccttag    2400
catcaagttc tgccgtgatg gtggctcgac cgaagagctt ccattctgc tttaaagtat    2460
gcaaccatgg cgactcatgc aggtcgttat agcaatgcat aatggctcta gaagaaataa    2520
tgaggctgct taaagacaaa aacgacaaat tatattagcc cgcacttata tgcagatagg    2580
catcgtattt ttctttcgga aaagtgggat gaccgcattg gtattctatg aacgtgcgct    2640
acaaatgctc aaaaagaaaa aggaggaaag aggtatctct atagcctaca caactggct    2700
aacatttatc aaaaaaaagg aaatactcaa gaagcctact cctatataac aaagctttgg    2760
atatacaacg aaccaatggt gatagtgtaa gtagtgcaac agtctcatga atatcggcac    2820
aattatgatc aatgagaaaa atctgaggat agctataagc ctttgaaaga agctcttaca    2880
atagcatcca aataaatgat atcgagatcc aggccctatc ttatgcacat cttgcatatt    2940
ttatgcatgg agaagcgaat acggcaaagc aaatgaagtg ctcacaatcc agaaaatttg    3000
```

```
gcatgccatg ccgggtataa tcaaaccaga ttggcaattt ggatatagcc agttccatat    3060
atgccgaata cggcttgtac tctttggtta tgaatgccaa aaaagatcca aacttctggc    3120
agactctatt gccgccaaca gatgcaagaa aaaattacgg agtttgacat tcggttcaaa    3180
agcaagagaa agaggccgaa atagcactga aaaaccagga attacattta gctccaaatt    3240
acatattgcc cttatcataa tatccacact gttggtggca acctcattac ccttatcatc    3300
catgcagcaa ggagatacag acaaaataag agctgcgaga aatgaatgac accagaaaca    3360
gactcctctc cattatctca ccgacatcaa gggtccggct atagcacaga aaatggccct    3420
cgacactata tatcatcttc atctgactgt ggctctatga ctcggaatat gctttcttca    3480
tacgcaatag tgtagcaaca gaattgactc ttttacagaa tttactcgtt ggtctaatat    3540
ccaaatcggg aatttagctc ccaaatttgt ggtttttcaca ttgtggaaaa cattggaaag   3600
gtgatcaatt tatactctat ttctgccgga ataaagatat tagcttacat ttggaagctc    3660
ctaaacaatg tttggtcatg ctgaccaaca aatgatcaat accgtaatac gcaatttact    3720
cagtatgcaa tcaaattctc taaagcagga agcgtaaatac acatccgtgt ggagaaaaag   3780
agaaagccat ggggatcaaa gtgtctgtat cagacaaagg tatggcatga gcaaaaaaca    3840
aataaccgat atcctc                                                     3856
```

(2) INFORMATION FOR SEQ ID NO:640

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 789 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...789

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:640

```
aaccggctgc catccggcgg atcaactcga caaagtcgga tccgattcga gcatgacgac      60
ttccgtttcc ggatctccca tacggcaatt atattctaca cataaggatc tcctcctaca     120
ttcatcagtc ccacgaagat gaatccggat aatcgattcc ttcggctatc agtcccgata     180
tcgtaggccg gataatcgct cttccacctt ccgcatgaat gcttcatcgg cgaaaggtac     240
tggcgaacgc tccccattcc gccggtattg agcccggtat ctccatctcc gattgcttat     300
aatctttggc gactggaagt atgtgatagt ctttgccatc ggtgcaacaa atacggagca     360
ttctatgcca tcgagaaact cttcgatcac caacgacggc ttgcagcacc gaatttgcca     420
ccgagcatct cagccaactc cgtttggctt cttctgcagt cggagcaata atcacccct      480
tgccggcggc aaaccatcgg ctttcagtac ataaggagcc tgcatcgtat ctatgaatgc     540
ttgcctgcat ctgtttggtc agccgtgaat gtctgataag cggcagtaga atcccgtgtc     600
gtttcataaa agacttgctg aaatccttgc ttccttcaac cgtgcaccct tggcatcggg     660
ccccacaatg aggagatcgt gcagtggtcg tgatttcgga agtagtccac tatgccacgt     720
acaaggggtt cttcagcccc actaccagca ggtcgataga actcgcgctg taccacttcg     780
gcaacggca                                                             789
```

(2) INFORMATION FOR SEQ ID NO:641

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 2202 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

(iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
    (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...2202

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:641

```
ataaacaaag ttttggaaca tatatccaaa gatttnattt atatatccga ggcttcggac    60
agagattttc cggccggaaa atttattttt gtcggttgcg ggaaaaattt tcccggcccg   120
gaagaaaaca atcgaccggc gatgagtaac cgatatagct gtacagaaga aatggccaag   180
tttgtgatga gagaaagccc gatatgcaag gcacgggcaa gcggacgatg tatccgaaaa   240
tgatcgccga ggcacgatgg ggctggacga gatagccgat ctgatttcct cccatcgaca   300
ttctccccgg gtgaagtcaa agggttggtt acggccttgg ctcgacgata gcccacggcg   360
tggcttcggg atatacggtg aagatagagg agtcggctct ttctccgctt cgctcacctt   420
gcacaaaggc gtagaacccg agaggccgaa ggcggcacac gccgtaatgc cgccagcgtg   480
acgataggag tgtcaatttc cgccccgaca aggcattgat tctcgaggct cgtactcgct   540
tcatctggtg cgaactacgg tacgccgtcc ccgtcggccc aatttgaccg cgaagagcgg   600
ctggccttgg ccttgcgcca tctcgatggc catagtcgct caaggtggcc gattattgca   660
gacttacggg gctgggacgt accgctccgc ggaagaattg cgcgctttcg atcgcgaggg   720
tctgatcgac tccacgggag cggcacgcat aaggtatata ttataaggaa caaagccggg   780
atctacaagg cgggaagacc accgttacgg gctttttgcg ttcttaagaa ttggctattt   840
ttgtgtgtgc aaagaaagat gtgtcggata ggcgaacctt gccttgccca gttgagagtc   900
cgagtcgttg ccgggagaca gagagagaaa gtattcgccg aatttttttg tgcagtctaa   960
cctcataaca tagatttaat agtcttatct ttaccgccat tgtcgtattt cttttcatcc  1020
ttgctatatc gacttgattg tgggtgtcag caacgatgcg gtcaacttcc tcaattctcc  1080
atcggagcca aggctgctcc attcaagatc atcgtcggtg tggcagcttg ggggttttt   1140
gtggcgcagc catgaacaac ggcatgatgg agatcgccga cacgggattt tcaggccgga  1200
acattacact ttcagcgaat tgatgtcgta tttctgtcgg tggtgatcac cgatgtcgtc  1260
ctgatggata tgttaattcg ctcggcatgc ctacctctac gaccgtctcg ctcattttcg  1320
agcgttaggc ggttcttttt ttatggccat gaccaaggtg ggcggtacgg tcgctttcag  1380
gatcttctca atacggagaa agctctttcc gtcatattgg gatcttcctt tcggtgggaa  1440
ttgctttctt cttcgggatg gtcgttcagt tctgagccgt ttgctcttta cctttaatta  1500
caggcggaat ctccgatggt ggccggcctt ttcggcggag ttgcggttac atccatcatt  1560
tatttcatct catcaaaggg ctgaagggcg tgtcctttat gaccgaagaa tccacggttg  1620
gatagctgcc aatacgggca ggctggtatt gtactgtctg gtcgttccat tatcctgatg  1680
caggtgctgt attggctacg ggtcaatgtc ttcaagtgat cgtcctcttg ggtaccttcg  1740
ctttggcgat ggcttttgcc ggcacgactt ggtgaacttt atcggtgtgc cgctggccgg  1800
ttattcctct tattggactt caatgccaac ggaaacgggc agtacgatac ttatctgatg  1860
gggccttgaa cgaaccggct tccactcccg tatatttcct cgtggctgcc gtatcgtaat  1920
ggtatatgcg ctgattacat cgaagaaggc tcacaacgtg tcaagacttc ggtggatctg  1980
gcgcgtcagg aggaaggtga ggagatgttg gctcctcggg cttggcccgg agtatcgtgc  2040
gtttcagcac cacgacggca atgccgtgtc ccgtataatt cctcgtcccg taggccggtg  2100
gatagacgtc gcttcaatca ggacgaactg atcatggcca agggcgcggc tttcgattgg  2160
tgcgcgcttc ggtcaatctt gttcttgccg gactgctcat cg                     2202
```

(2) INFORMATION FOR SEQ ID NO:642

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 696 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:

(A) NAME/KEY: misc_feature
(B) LOCATION 1...696

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:642

```
aattgctctc acgttccttt tgcatcgact ctattcgtgt ttggttcagt cgcgaaaacg    60
ctgtagcaag tctttcagac gctcttcgtt caagtccgtt cggccataga cgaagttgta   120
ctgtcggccg attctcctgt acgagccgct ttttcttata gaaagcactt ttgtaggcct   180
ctacttcctg tcggcgggta gctcttctcc ttggagtaat atggccaagc tgtcaagtag   240
ctcgactcgg tcatgtccgc caaacgggcg tttacacttg ttttactttc ttcgctgatt   300
tggattcgtt ttccaaagga gtcggatctg ccacttccag gcttgagcct ccggcaaccg   360
gtctgttgtc gtaggtttca attcttcgga ttaggctgtg ccattgaatc cgtgagaggg   420
ttcgtagggt tttccatacg tactgcttta atgttcactt ccaccgaaaa cctcctgtcc   480
ggagagatac attcggtact tttccaatac aacggaaggt aattatcaga taatgattcg   540
ttttcaaaag accaaattaa agaaaaaata ttgacagacc ataatttgaa ggtgtttgca   600
gggcaaggca ttcaaaacaa gcattctata aagttttag tccgttgaat gaagtccgtc    660
ggtcatgtat tcaagtcact atcgggaaaa tcctct                             696
```

(2) INFORMATION FOR SEQ ID NO:643

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 954 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: double
(D) TOPOLOGY: circular

(ii) MOLECULE TYPE: DNA (genomic)

(iii) HYPOTHETICAL: NO

(iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
(A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
(A) NAME/KEY: misc_feature
(B) LOCATION 1...954

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:643

```
ggtctttcca ttcaattcgg acttcgtgac gatgaatcgg cggctcacca atgcgactcg    60
gtaggtatcc actgcttcct atccatctgt acctctgtcc gatgaagctg ctaatcaccg   120
cagtattttg cggattggta attacgaaac cctgtcgttt tcatttagaa ccgtatccga   180
atgtgccagc gaaatatgtt ggtacgcgaa tccattgtgc gcgaaatcac gtagtcatga   240
cctttagcag ttggcggact tccgctaatg ttttggagaa aacggccgga tttttacaac   300
cagagagagt gcgatagcct gattatcatc gttatgttcc agatgtccat cttctctttc   360
tctttggcca cactgatctt gaaaatagct cgacgatcag catggacgca ataatcccca   420
ccactccgag cggataagcc aagcataacc gagtgtgata gtcggatcgc cggttcccgt   480
tagatcatgg atgtctgctc ggcagctccc aggcccggtg tgttcgtgac ggcaccggaa   540
gaattcctac cattgtggac atggatatgc ctgtcacgaa gtgcagaaca ccgttgtcag   600
tacccccaga aagacgacgc ccatagccag taggttcagg taagcccccc cttgcgaaga   660
gaggagaaaa aacccgggcc cacttgatcc ccaccgagta aacgaatagg atcagtccga   720
actctttgaa gaaatatgta cgtcaggatg cagattcatg ccgaaatgtc ctaagactat   780
tccgcaaaaa gaacgaaagt aacccccaaa gaaattccga agatctttat cttcccaacc   840
aaatccctaa ggcaatcgtt acggcgacca agagaatgga gtccccactc ctacaccgaa   900
aagcaagtca ttaagccatt gcatattcat caaacagctt atagtagtca atag          954
```

(2) INFORMATION FOR SEQ ID NO:644

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 567 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: double
(D) TOPOLOGY: circular

(ii) MOLECULE TYPE: DNA (genomic)

(iii) HYPOTHETICAL: NO

(iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
    (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...567

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:644

```
gatccccagt tttcaagacc aacgttggta agtatatagc ggtatttacg tccttattca    60
tttcgctgac ttgctcgcgt actatccggt acattttcca ttggcttccg cctgtttgtt   120
ggccaaagct tgtgtcatgc tgagttcaat ctttggcctt cttcttgcat cttcaggatt   180
ttctcctgtt ccactctgca gcatcttcgc tggtgaatgc attcgtccga agacggcgtt   240
ggaaacctcc gcagctttct gcatggcagt catcttggta gccaaggttc tttgttctgc   300
tcagcttcgg ccgcaagttg tttgttcatg tcccgaaagt attatattgc gaggccaggc   360
tgtccatcct tacgaaagct ataggcagag tgcggcagct tgttctgcct tatgatttgt   420
tgtcttggct tttgatgccg agaacgcggc atcataatga agaggatgat gatggcaacg   480
gccagtacaa cctcgatgac ataatggatc tgtttcattt gtgaatggga tatgtttttg   540
gttcgtatta ttcgagttct ttgattc                                       567
```

(2) INFORMATION FOR SEQ ID NO:645

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 1259 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...1259

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:645

```
gcaatataac cacggaagac aaatggctcg gtcaggctct ttgtattgct cggctgaagg    60
aggcccatcc gcagacaatg gtgaaagtga tatccagctg agaatataat cgccaatctg   120
cttacccagt atggctatac caagatttca aatgttatga tccgggagta actcctaaaa   180
acattattga tgctttaacg gaggaatctc gttggccaac tatacgggcc acggaagcga   240
aacagttggg gtacgtctca cttcggcacc actcatgtga agcagcttac caacgcaacc   300
agctaccgtt tattttcgac gtagcttgtg tgaatggcga tttctgtaca acgtaccatg   360
tttcgcagaa gccctgatgc gtgcacaaaa agtggtaaac tgacaggtac tgttgctatc   420
atagcgtcta cgatcaacca gcttgggctt ctcctatgcg cgggcaggat gagatgaacg   480
aaattctgtg gaaaaacacc cgaacaacat caagcgtact ttcggaggtg tcaccatgac   540
ggtatgtttg ctatggtgga aaagtataaa aaggatggtg agaagatgtc gacacatgga   600
ctgtattcgg cgacccctcg ctgctcgttc gtacactgtc ccgaccaaaa tgcaggttac   660
ggctccggct cagattaatt tgacggtgct tcagtcaacg tatcttgcga ttataatggt   720
gctattgcta ccattcagcc aatggaaaga tgttcggttc tgcagttgtc gaaaatggaa   780
cagcacaatc aatctgacag gtctgacaaa tgaaagcacg cttaccctta cagagttggt   840
tacaacaaag agacggttat taagaccatc aacactaatg gtagcctaac ccctaccagc   900
ctgtttccaa cttgactgct acaacgcagg gcagaaagta acgctcaagt gggatgcacc   960
gagcacgaaa accaatgcaa cactaatacc gctcgcagcg tggatggcat acgagaactg  1020
gttcttctgc agtcagcgat gcccccgaac ttcttcgcag cggtcaggcc gagattgtct  1080
```

```
tgaagctcac gatgtttgga atgatggatc cggttatcag attctttgga tgcagaccat     1140
gatcaatatg gacaggttat acccagtgat acccatctct ttggccgaac tgtatgtccc     1200
ggccaatctg ttcgctccgt tcgaaatacg gttccggaaa agcagatcct tcttggtcc      1259
```

(2) INFORMATION FOR SEQ ID NO:646

      (i) SEQUENCE CHARACTERISTICS:
          (A) LENGTH: 356 base pairs
          (B) TYPE: nucleic acid
          (C) STRANDEDNESS: double
          (D) TOPOLOGY: circular

     (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

     (iv) ANTI-SENSE: UNKNOWN

     (vi) ORIGINAL SOURCE:
          (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

     (ix) FEATURE:
          (A) NAME/KEY: misc_feature
          (B) LOCATION 1...356

     (xi) SEQUENCE DESCRIPTION: SEQ ID NO:646

```
gctgtccgtt tccctatcct ccacgggcgc atggcttggg gtggagtatt tccgagagct      60
tggctcgcag gcatacggca cctcttacga ggagggtacg gcttcgtaga taatatcctg     120
tgggcggaag tagtagtaac cattgtcctc agcagggcac tgatggtctg acgctcttcg     180
tgcagctttg ccaaatgaac tggtctcctt tcctgatcaa agacggagtc tgcctgtaag     240
ccagatgctg tcggggaaag tgctgatcgg taagggaatg atgctgtcgt aatgtaagga     300
gaggccatat ccaccgtata ggagattttg gctttgagcg agtctttttc agagtg         356
```

(2) INFORMATION FOR SEQ ID NO:647

      (i) SEQUENCE CHARACTERISTICS:
          (A) LENGTH: 2191 base pairs
          (B) TYPE: nucleic acid
          (C) STRANDEDNESS: double
          (D) TOPOLOGY: circular

     (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

     (iv) ANTI-SENSE: UNKNOWN

     (vi) ORIGINAL SOURCE:
          (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

     (ix) FEATURE:
          (A) NAME/KEY: misc_feature
          (B) LOCATION 1...2191

     (xi) SEQUENCE DESCRIPTION: SEQ ID NO:647

```
tagaggatcc cctggaaaaa attccttttc attttttgacc gcctgtcata ctgatcgcta      60
tgccttttta gcaacgtttc cttcacttgg gcaaagaaat tatatctgaa gtgaacagaa     120
cagccttttc gttttttaat atagagcgag cataatccga cctcggccat tctttcagaa     180
aaagcgaacc gcaatccaga aataatggaa cgagaatctg aaaaatctca cgccacaaag     240
ttttcttttg gtttgaaaat ttttcctttc cgacgcagga aaaaaatatt ttaccgcgac     300
tttttgagtc ctcttaagta aggtattttt tttaacatac ttgaccgaat tatgcatcta     360
accatagtgt agaatcctca tctgtaggta attgcaccga acaaccgatt tgtcagtaca     420
ttatgtctga cgaaacgcgt attttgactt caaatgaaag aaagattgaa ccaaaccgta     480
cgctattttc gcctatactc ttcgcagtat atgccggcct ggtcatatct ttcactcact     540
```

```
ccatatcatc aatggcgtga tcatcgtcca ctcccacgta cagtgggggga caacgaaagc    600
gatccgcagg acaatccgca ttcggattcg gaattgatct gtacaatcag ctttcggcca    660
tattcacgac ttatttggat acgccgccat agacttgaaa gaacctgtga gggttgtcgg    720
cgtcgttcct ttctttgcga taatcttact gctctcattt cggagctaac tccttccaat    780
catccagggc tcctcccgta gcctgatcca ttcttacctt atttcggacg atcattcatt    840
cggatggtat tgcgcgcgct tacaatgaga tccgttgcat cgcacttgta gatctgcctt    900
tctatgctga tttatcaagg ggatcgaatg tcatccatag ccgtgatgca aggattttca    960
tccttcttaa taccgatctt tcgtgggata gggagtggga cacactctcc taacctcaaa   1020
aaccgactaa aaggatcgga ataaggatac cgaacagaca ctatatccat atcaagccat   1080
caaaccaaaa aataaaatga aacaactaaa cattatcagc ttcatcatgc tttcctattc   1140
ttaggaacga gcgcatcggc tcagcaatcg ggcggaccgt tacaggtacc gtagtggaca   1200
aaagctcaaa agaacctatc gcatagtaca agtattcgtc aaaggaacca ctctcggaac   1260
ttccacggat gcaacggaaa ctactcgatc aagggaatcc cttcgggtaa tcaaactatc   1320
gtacccgact catgggttac tccacttgcg aagaaaaagt acatatagaa aaggtggttc   1380
ccgccacgta gacctctatc tgaccgaaga gattctctct ccgatggggt agtggtatct   1440
gccaatagaa acgagacttt ccgccgtcaa caccctcgtt ggtaacggta ctgtcgccgg   1500
aacttttcct caaaaccaat ctaccaacct gagtcaggga cttaagttcc agcccggtct   1560
gcgcgtgggg acaactgtca gaactgcggt ttcaaccaag ttcgtatcaa tggactcaag   1620
gagcctattc gcaaattctt atcgacagcc atcccatctt cagttccttg ccggtgtcta   1680
tggcttggag cagatgcctg ccaatatgat cgaactgtag aagtaattcg cggtggaggt   1740
tcggctctgt tcggctctaa tgcttgggag gcgttatcaa cgtaattacg aaagaaccgc   1800
ttcgcaattc ggcgagatca gccattctac gatgaccttc gaccacgcga aagggtgggg   1860
gacttccaaa atacgaccca gttcaacggt tctatgctga cggaagaccg caagccggtg   1920
tcatggtatt cggccaacac aactaccgtc ccggacagga atagacggcg acaactttac   1980
cgaactaccc aatctgcgca accgctcgcc ggtttccgct catactataa gaccggtcta   2040
tacagcaaag caaccctcaa tatcacagca tgcaggagta ccgtcgtggt ggcgacagac   2100
tggacaacct cctttcgaag cccagatagc ggaatatctc cagcactata tcaatgcgga   2160
agtttcaaat tcgatcaggg cttcagcggg g                                  2191
```

(2) INFORMATION FOR SEQ ID NO:648

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 919 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...919

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:648

```
catcgaagtt ctattttcat caagcgtcct tacatctctg ttgtgggcat attcagaaga     60
agattctcgg agaactttcc aaaggtgaac gctccagtat ggctttatag accgcattct    120
atttgtgatg cctaatcttc agcagaagcc cgatggagca gaaccgagct tccagatgat    180
acagagaaac gctgggaggt attattcgac ggctcataga cttaccatgt gccaaggatg    240
aagaagggaa gttacccctg agattattcc ctttgaagaa gatgccaaag ctcgctctat    300
atgtggcagg aagagcatgc tcgactatgc gatactgagg ctatgaagta cttgtaggag    360
tctattgtaa attagaaatc tacatcatcc gttttgtctc attattcagt tggctcgatg    420
ggtatgtggc gaaagtgaaa atccgctata gacctgacat ctgtggagcg agccatcact    480
cttaccgagt tttccgccat tcggcacagc aagtacacgc agagatcgca ggtgttcagt    540
cactcagcaa cagcaacaac tccttgccga gctaccagca tcttttcaac tgccgaagcc    600
ctgagtattg cccaaaaatt ggggatgaaa gaaagagttt taggatttt ctcagtcgta    660
atatcggaca cctctttgct aaggaagaca cggactttac cataaactca atatgtaacc    720
gagcgcactt tctgcttatc agcatttcgc cacccttat taaaccgaaa gtgtacaaag    780
tgcaatagtg tgccattcaa atcaatttta tcaatgagca attatagatt caattagaac    840
catacaaagg tgtgcggaca cggcatacct gcccatcgtg cgacgtcctc gatgcttcgc    900
```

tcgctatatt gacacagag

(2) INFORMATION FOR SEQ ID NO:649

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 936 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...936

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:649

```
gaagacgatg tgacggagga ggaattgctg gcctgcgtgc atcgcctgat caggatccga    60
cggtagatgg cttcatcgta cagctccccc tcccgaagat atcgacgagc agaaaatcat   120
cgaagcagta gacccgcgca aggatgtgac ggatttcatc ccatcaacgt aggccgtctg   180
agcatcggtt tgcccgtttc gtctcggcca caccgaaggg aatagtggaa ctgcttcgtc   240
gctacatatc cctaccagag gcaagcattg cgtagtattg ggacgcagca atatgtaggc   300
aagcccgtat cgcagcttct gctccaaaag ggagagccgg gcgctgcacc atcaccatct   360
gccatagccg taccctaac atcaaagagg tagtctgacg gccgacatta ttattgcagc   420
tttggggcag cccgaattcc tacagccgat atggtaaagc ccggagctgt agtagtggac   480
gtaggtacca gcttgtaccg gactcgacac gcaaaagcgg tttccgtctg acgggcgact   540
caaattcgat gaagtggccc ccaagtgctc gtacatcact cccgtaccgg cggagtaggt   600
ccgatgacca tcgtatcgct catgtccaat acccttcggc aagtaaagga ttgtaccggt   660
aaaccctcct tcccttattt gccaacacct tatcgaagag gcccgtcatc aatatcggtt   720
cgtccggtat gatgacggcc tctttctta ttgacagtgt gtcatcatgc gcaaattgct   780
gcgtgcttgc ggcattcgtt tcttagcgcc ttgnacttta cgcattctta ctccctaaaa   840
tggggtatgc caaaaccgaa ttttgacacg ggctccctcc tgcgatactt tcaagaattc   900
gcttcgtatc ctttccgtta ggaggtaaag ggtact                             936
```

(2) INFORMATION FOR SEQ ID NO:650

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 3434 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...3434

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:650

```
tgcaccaacg gttcgccttc gttggaaaaa gaccttcgcg atggcttgga tatggaaagg    60
```

```
ctcatgactg gaaagcgtga acagcgtacc tacgaaagtt gtttcatacg gctgagttcg      120
tccacggcat gtagtaagaa cgggctctcc cagatgcccc atacgccatc gaaatcttca      180
tcgtgggcat actctgcttg ccgaaataac gtttgtagcc ggcttgtttg acaaaagcat      240
cgaagccatt gatccgtttg gtgcaccatg caagaaaatg gattgataac cgatcgcccg      300
agagccgtcc ccaatccttc aatctcattg cccgaatagt gagtgtaatg aagtgtgagc      360
ggagggaagg caacgagctt aatatggacg gctggcatcg atactcttgc gcccgttggc      420
aaaagcctgt tcgaaaaggt accctttttgt gaaatcgagt cgaagcaggg tgtatatcct      480
ttgtaatcgg aatgtcttgg ttcagccgtc ctacgtattg gcgagcaaag ctttcgatgt      540
tatcaccatc acgttgcgtc cacgcaactg actgaaacga gctgtcgttc cgtcgccaaa      600
tgatgaatgg gattgaatac ttgctccaac tcctttttgga ggcataaaaa cgcttttcct      660
ccaatccctg tttgccaatg gtacgatgat gctgtagggc gtgttcagta ccaaagccct      720
atgttccact ttgtcaccga cagattggca taactcattg tcataggacg ccacgacttg      780
gcaaactgcc tnctcgtata ccccatacga taaatgcaat agcggcaacg aggctaccaa      840
cgtgaactgt ataataatgt aggctgtctt tcgcttcggc atggtgcgta ccggcttgac      900
ccgatgatat agccatacca tagcagcaac gggactatag ccagcaggct catataccag      960
taattcagga gaagatgcca atcagtcctc cgccctcatg gctgaattca gagaaaaccg     1020
tcgaggatgt cgtttcaagg tgtatggata gtaaatacaa tcggccagac ctgccgccgc     1080
cccaaagcat ttggcacgaa aaaggtccag tcggtcagga ttcgatagat cgcttggcac     1140
gaaacctgaa cggcagaaag ctcaacagaa taaaaaggca ttcaaataca aaacggaagc     1200
cgtgtcgaac ctaagccctc ccatcatgca cgccatacct gctcggcagt catgtcggca     1260
aaaaagcgat agttaagagg tagaacagtc cacgggcaat accgaaaagg aaataagcca     1320
atgcatacga taggcaaaag cccaccagct gttcgttcgt atcgtccgct taaaatattc     1380
atatctcttt gtgtgtgttc tattcggatt ggaggcaggg acgagggtaa tgaatgattt     1440
cggtcacata tccccccaat tgagcctatt catgattcgg tgcacgatgt atcccgttgc     1500
accggcattg gatctgatga gtctgctgct gcgcgggatg cggcgtccct ataggccttg     1560
tccgtttgat tcgcttgatc aggttgccaa attcctctgc tgaggatacg gagaagctcc     1620
gccgacatct atcaattcac gggcttcctt gaatttctca tatcgtgtcc gaaaataacc     1680
ggtataccat agactgcggc ctcgggtgta ttgtgatgcc tttgccgaat cctcctccga     1740
taaaagctac ttgaccgtag cgataatgga ggataggaga ccgaagctgt ctacaatcag     1800
acaatcctgc cggcaatatc gctttccgta gcttccgaaa gtcgtatgaa aggccgtcgt     1860
attgcgatat gatctgaagc aaatgttcct tgtcgatttc gtgcggtgcc atatgagttt     1920
gatcttggga tttcgattga agtagcgtac gagtatctct cgtcgggagg ccaactgcta     1980
ccgcccacaa tgaccaaacc gtcttccgga cggaagcagc aaaacgctct atcagcggaa     2040
gcgatttccg agcttcatta cggagatcac ccggtcgaag cgcgtatctc ccgctacgga     2100
tacatggcta tcccatgctt ttcaagtagc aggcgtgaag ccttgtcctg aacaaaatgt     2160
gtgtaaagca gtgtagcaaa cgtttgtatg ctcctccata ccagcgaaaa acagctgtga     2220
cggtcggaag atggatgaaa ccagataggt aggttctgcc tacgctccaa ttctgtcagg     2280
aaacagggcc agaagtcgta tttatgaaaa tagccatctc aggcttgacc agatccagaa     2340
acttacgcac tcggcaaacg atctgccggc aaatacacga tcacgtcggc accttcgtaa    .2400
tcttacgtac ctcatatccc gaggggctga agaaggtaag cacgatccta agtccggata     2460
ttcgcttcgg atgcgttcta tcatcggtct cccctgctca attcgcccaa agaagctgca     2520
tgaaaccata tatagcgccc gcccggcata tgccctcacg cagctgacgc cacaccttcc     2580
atcgcccacg aaccatctgc gggctttggg attgaacgga acggcaagtt tgatcagcga     2640
agaataacca atccgatcag gctgaaaagg aatcgcatat atttcgaaaa aaattttgct     2700
gtcagcctaa gacttcgatg gcacgacgta tgcgtccaac ggtccttcac gcccgagcac     2760
ttccatgatg tcgaagatat gaggtccctt gcttcgccca cgagtgccaa ccgagtggca     2820
ttcatgatat tgccgaggtg atgccattgg tctcgatcca attcttcaca gtgggttcgg     2880
ttgcttcggc tcaaacgatc ggtgagagtc cagcaattcg gctagttcgc ccaactgctt     2940
gccgtatctt ctttccagcg ttttttcact gtttttttcat cataggatac ggtgcgatga     3000
agaagaatcc ggcttgctcc catagctctc cgataaagtt acacgttcct tgacgaggga     3060
gattacatga gctgttttct cgtcggtgcc actactccat tttcgcgaag gatgggacgg     3120
aagagttcgg ccaactcgca ttgtccttac gctggatata ttggtgattg aaccagcgtc     3180
ctttccgtag tcgaacttgg ctccggcctt gctgcatttt tcgatgtcga acagcggatc     3240
aattcgtcca tgctcatgac atcctgatca ttgcccggat tccgcccaga agcgcgagga     3300
agnttaccac tgcttcgggc agataacccg cttcacgata acctttggat atatctcccg     3360
tttgggggatc tttccactcc acggaaatac cggaaatncc aaacgatcgc catcgcgttt     3420
gctcagctta cgtt                               /                        3434
                                                                       3434
```

(iii) HYPOTHETICAL: NO

(iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
     (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
     (A) NAME/KEY: misc_feature
     (B) LOCATION 1...529

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:651

```
cctgcaaatc gcggctctct atatcaattt gctcttccgt caggaaatgc tcgtacggca     60
gaaacacagt tggcactgat tcgcgagcaa cgcaatcgac ggccgaaatg gttcgcgtag    120
gtaaatgggc agagggtaag ctcctcgcat aaatgcccag atggccaagg acgaacaact    180
tctcgtacaa tatcgtcgga ggaggagctg gctcgtctgg acttgggggca agccctcgaa    240
ctggacaccc cgaaagcatt gcagtcaagg ctcccgacac agacgttctc gtagagaaag    300
gttgggatct ctccttgctc ccgaagagat ctatcgcacg gcttcggctt gaaaccggca    360
ctgcattcga gcgagctgca aatagcttcg gccgcgaagg tctggcctcg ctcgtgcggc    420
atacttccga cgctcagcct cctgccggat acagcaacgg ttactttccg cgacctcggc    480
aaggagtatg cgccatcaac cccttcttct ccgaacagtg gaagaacaa                529
```

(2) INFORMATION FOR SEQ ID NO:652

     (i) SEQUENCE CHARACTERISTICS:
         (A) LENGTH: 571 base pairs
         (B) TYPE: nucleic acid
         (C) STRANDEDNESS: double
         (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
         (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
         (A) NAME/KEY: misc_feature
         (B) LOCATION 1...571

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:652

```
agagaaagat tcttatgaaa agaccttgct gatgtctgct cgtaagcata tattgtagcc     60
atcaggatat tcgatcggcg agaggccgat ctgccaaagt agggttgatg cgctttcgcg    120
atgcagagac agggcagact cattggggga taccgctgat agctccgttc ggaaagcgta    180
tgcggatgcc tatgaggacg gcaagtagca cttgccgttt tgctcaaacg atgtggtgta    240
gatacactga gatacgtacg gggcaggatt tcgtgcagca gcttcttatc ttattaaaaa    300
acgctcatga gacactctct tgccattcgc tttgttcttt ctgattttgc atgctctttg    360
tctcttcctt tctgaaggcg caagagcttt cttcataggc aaactcgacc gtgcagagat    420
gcaaatagga gagcaggcag tatagatatt actatccgca cggcagattt ggcgcatact    480
catctgcaaa acctactgat tcgacgatga gtcggatcga aattttggcc tttggcattc    540
ggatacgttg ttgtgaaaga tccgatcgtg g                                   571
```

(2) INFORMATION FOR SEQ ID NO:653

     (i) SEQUENCE CHARACTERISTICS:
         (A) LENGTH: 600 base pairs
         (B) TYPE: nucleic acid
         (C) STRANDEDNESS: double
         (D) TOPOLOGY: circular

```
      (ii) MOLECULE TYPE: DNA (genomic)

     (iii) HYPOTHETICAL: NO

      (iv) ANTI-SENSE: UNKNOWN

      (vi) ORIGINAL SOURCE:
           (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

      (ix) FEATURE:
           (A) NAME/KEY: misc_feature
           (B) LOCATION 1...600

      (xi) SEQUENCE DESCRIPTION: SEQ ID NO:653
```

```
tatattgaaa atcggtgata atatccttaa catataggaa gttattcgac aatatctacc      60
atcttgacga atagttgatg tttccacgat tgaaatcagt acccgtcctc tgattttgta     120
ttaaaaatta agcaaccttt atccaaggtt ttgtactcaa gcctaactga ggtttgatgg     180
aatattctcc attttctagg atacggttaa aaagctatct ttagcttctg ttttgagaag     240
cataatgcat caactgtttc attgttaagc atgcaaccat caatgtaaat tataaaaact     300
caccattagc aatattaggg tgtatgcttt gatcataaag gtgctagcaa gattgttaga     360
ttgttcaact atatcatctt tgtcatcaaa ancttgtgta caaatctata tgacggattc     420
atgtctaaag actctataga acaaactgac agaaaacatc aaacttgaat gtgttttta      480
ctaatgttga ataaatccag aagcaaacga catatcatct gctttagaag aaaatgctaa     540
ccttcttctt ttaacttatt gccaaccttt gtactgtggc gattgtagga ctcctaatta
600
```

```
  (2) INFORMATION FOR SEQ ID NO:654

       (i) SEQUENCE CHARACTERISTICS:
           (A) LENGTH: 534 base pairs
           (B) TYPE: nucleic acid
           (C) STRANDEDNESS: double
           (D) TOPOLOGY: circular

      (ii) MOLECULE TYPE: DNA (genomic)

     (iii) HYPOTHETICAL: NO

      (iv) ANTI-SENSE: UNKNOWN

      (vi) ORIGINAL SOURCE:
           (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

      (ix) FEATURE:
           (A) NAME/KEY: misc_feature
           (B) LOCATION 1...534

      (xi) SEQUENCE DESCRIPTION: SEQ ID NO:654
```

```
gaaagcagca aaatgccata caggcatacg aagaattgct aagtctcgac ccttcaacga      60
agaaggtcac tgcggtattg ctacactcat gatcaaagag gacgatcagc cgaagcagaa     120
acatttctgc gcgaagctat cgaagagtgc cggttcagcg caatctgatt ctgatgctcg     180
tcgaaatatt ggagaaaaag gacaaacgca ggaagcagca gaatggcgtg ccaaactacc     240
ggaagagagg tggaaagcga agcggttaat ttcaatgatc tttacaaggg taactctatt     300
aacttctttc aaattaacac ctgacctcga tggcaaagaa gtgtatgtgg tctggaccgg     360
gcatacaccc ggagtttatg ataattggga tgatgtcgag cgcaaacaga gggattcaat     420
aaagcccgct acaaaagctt tctaccgaaa gcgatgccct aagagcctat gaagacggag     480
cagatgaatt taccgcagaa gcatacggat ccactggtac cgcaccggag cana            534
```

```
  (2) INFORMATION FOR SEQ ID NO:655

       (i) SEQUENCE CHARACTERISTICS:
           (A) LENGTH: 703 base pairs
           (B) TYPE: nucleic acid
           (C) STRANDEDNESS: double
```

        (D) TOPOLOGY: circular

   (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

   (iv) ANTI-SENSE: UNKNOWN

   (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

   (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...703

   (xi) SEQUENCE DESCRIPTION: SEQ ID NO:655

```
cgaccccttt gatgtcggac aaacgtgctg tcagttctgc cagacggttg caccgtacag     60
gtcgaggccg tagaaggtaa gatcctgagc aatcagttga actcccgagt cccatgcttt    120
acgagcatcc gtacctcttc gactaagcct ccatcgggcg cgaccgatgc cggccggtga    180
taatcggtat ggcgcatacg aacagctgcg atcgcagccc tcggatattt tcagataggc    240
ataatccgcg gagtggtcag tttgcgcctg ttctctgcct cggcataata agactcccca    300
aatgagaaat gagttgcttc cagtcgaatt tgccgtagta agctccactt cgggtatctc    360
cttcttcagg tcttcccgaa accgctcgct cagcagccca ttacgtacag gctgccgata    420
cgtccggcct tcttcgcctc cccatctcca gaatggtatt gacagactcc tcctgtgcat    480
cgcctatgaa ccgcaggtat tcaccaccac gatctcgccg cataccgaag ccggatcgta    540
tgcacggtat agccgttgga caggaactgg cgcatcagca cctcgctgcc accagattct    600
tggagcaccc aagcgtaatg acgtctactc tgtttctctc attcgccaaa ggagagagtc    660
cacgaattcc ttcttacgga agatctcagg tcgtcttatg ccc                      703
```


(2) INFORMATION FOR SEQ ID NO:656

        (i) SEQUENCE CHARACTERISTICS:
            (A) LENGTH: 1133 base pairs
            (B) TYPE: nucleic acid
            (C) STRANDEDNESS: double
            (D) TOPOLOGY: circular

   (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

   (iv) ANTI-SENSE: UNKNOWN

   (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

   (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...1133

   (xi) SEQUENCE DESCRIPTION: SEQ ID NO:656

```
tgaaaaaggc atccatccca gcatgagata gatgcctttc cttttatcgt ttgatccaat     60
tatttcgctc ctttggtttt acacgtatga tatctgctct accgtattag cttccatcga    120
tgtgtagtat ttttctttta cctgctttaa gcagcgagag ccttgtcgta ttgtttgagc    180
tcttcgtata cgcgacggct ttgatgagac agcccggtgt aatggcatcg ttagaggctg    240
cggcccagct ttctcaaaat agcctacggc ctcttcatat tttttgagct gtactaacag    300
tcaccgataa gacgagtgat agatggtgct accatatttt cctggaggag aatcccttca    360
gatgatcaat ggctttctga tattctccga ggtgtagtag caaatgccgg cataggcttt    420
tgccagattg gatgcatccg accggagtat tttttgatta ctgtcaacaa tcccatttcg    480
tttgcaccgt tccatttaag gctgcgctgt ccaattcctg aatgaatttg tcttcggcag    540
gtataccttg gcagcagctt cacgagcttt aggttcgctg acgaaacgtt gtaggcaaaa    600
atacctgcca caatgataaa aacgcccaga ataaccagcc gattttggtc atgttctttt    660
ctatgaactg ctctgagcgt gaaacccttc tcctacgtgg ttgtccggtt gttgattttc    720
tttttagcc atatttggaa taattattta tttctttcg gtcgcacaaa ggtacgcgtt      780
tggcgtgata tacaaatgtc ctgtccgaat aaatatacga tatgtaatgg ttgtcgaaaa    840
```

```
cgtttcttct cttcttgcct ccaatatccg atttacttgt ctctcttgag ccgtcaggta      900
gccgaaaaga gagctattgc caatccacta accgctcttt acggcatacc gtatcagttc      960
ggctgcattg gtgaatccca tttgtgcaga atattactac cggtgtgttt ctaccgttcg     1020
gtaactaaag tgcatttttt cggctgnttc tttggcagaa tagccatcgc acagatatgg     1080
actacttctt tctctcgttg ggtcaagctc gagaagtccg ttctgctctg tgc           1133
```

(2) INFORMATION FOR SEQ ID NO:657

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 398 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...398

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:657

```
cgactctcga ggatccccga ggagacgacg gacaggtgtc ccgcttcggg ggggattgaa      60
ccctgctacg atcctccaga acgagtacgt agctgtctca ttattttcca tatactactg     120
cgattataag gttatcgcag caaagatcgc gaggcaaaca ggaatgatga agatgggttt     180
cttagcgttt cttagatgga ttagaatgga aaagccgtgt atctgttcca atttctggct     240
tgccgatgca gatttatgtt gactgcagaa agaagactgt agtaatgaat gaattcttaa     300
aaatggaccg cgctatgggg aaggaaacca gctacggcaa aaaacaaagc aataccatgc     360
caatggctgt aatgctatat cggacgagtg gatataat                            398
```

(2) INFORMATION FOR SEQ ID NO:658

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 1362 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...1362

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:658

```
ttgcaatagc aacacataga taagccgggg tttgagaaga agattcaaag tcgccatagt      60
gagagattat atattattct ttatcagatc aacgaatcaa ttttgcgatt attctctccc     120
gtcttggggt ctttacagcc ccagtctgaa tgaggcagta cgtgccgtta tgctttttga     180
tgctttcgtt ttggcaccgg ggcagagtat cagctcctcc atagactcaa agaggtcgtc     240
cgggagacgg acacaccatg tgtgcaacta ttaggacga ctcccttgag cccaccatct     300
gccagacatt ccaagagata atataggcaa tatactcaat ggattgtcga ggggacgctt     360
```

```
accgaacttc tcctcataat actcgataaa gggattagta gtgcctcacg agcaaggagc      420
aggttatcgc cttgccattc aaagcataga tgttttata tgcctttga gccatcttga      480
gccattcgcc gtgcttgaag tattctctga gatgatgcga agctttctgt cgagcatacg      540
atacgttgag gaatagggat aaactccccc gtagtagtgt catacctgtc acaagataag      600
gagcttcgcc acaagtaatt tccatacgcg tggagcaaca tagtctttcc atgtcttacc      660
ttcggggaat gtaataggtt cggtagtgca atccaagtct ttgtctcggg ttgctcaata      720
ttaaacacat ccttagacca aaccaagcct catcgatcag attattctga gcgttgcaaa      780
cccagagggg gtgaatactt ctgctttatc cttggtgcgg ttggcttgtt cttcttggac      840
ttcagcactc tgggctgtat tacagtgtca tgctcccctg tatgctgtca gtcgtaattg      900
gtgcatcgta tttggtacgc atctcccagt gagtatagtc atctgtagcc caaaagatat      960
tcctctgagt cgtatggtca agaggagtct ttgcagaagt ccttcggact gacgcagtag     1020
ttcattctcc taatgtcgac ccccatcttc atatcgctca cgagtaacct ctttgcattg     1080
acaagcagtg gttgtcaaat tactgtatac catatagaat tgccatttgg gcacagatta     1140
gaaataggca cgacaaatct gcccctactc ttagccccgg ttggggacat caccaggaaa     1200
aagggcctcg gtcttttatc gttttttctaa actcattaca taagcaaagg tactaagtta     1260
ggggcatact aacgagggaa atggatattt ctttaccgag tagatcaaag tgcaacagat     1320
gggtaaacag cagagatttc cggcattcg ggttgggctt tt                        1362
```

(2) INFORMATION FOR SEQ ID NO:659

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 402 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...402

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:659

```
gtccaggcat tcaatagcat tttatcttta tttaattgca tcaatccact ccattctctg       60
taaagtaacg gtcattattg atcatccatt taccaacgtg taggcaaaat cagcatctaa      120
agaaagtcct ttccaagaag cacctaagag aaaccacctg taataggagg agtaacagac      180
ttatcaattc gtgtctcaag tcagctgagt actggcttgt tgtaacttta ttaccatccg      240
catctacttg accaggaaca taccacaact gcttaccggt tttttgtcg attnagcata      300
ttcagctcat atagaacgaa ttggggtacc caatttncca tatgtaccgg tattaggcaa      360
catgtactta ttgagaccna agaaaagctt ttttatttcc tg                        402
```

(2) INFORMATION FOR SEQ ID NO:660

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 672 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

```
      (ix) FEATURE:
           (A) NAME/KEY: misc_feature
           (B) LOCATION 1...672

      (xi) SEQUENCE DESCRIPTION: SEQ ID NO:660

tagccattgc tgttatccga agcatgaggc tggctaataa gaccataaga attttcgtcc      60
tgatatggta atcggtgtag gaggctatgc cagtggccaa ccttacgcag agcacattcc     120
ctcgggatcc ccaccctcat tcaagagaaa acagctatgc cggtgtaacg aataaactgc     180
tgagccgagg agcgcaaaaa tctgcgtggc ttatcccgaa atggataaat tcttctctcc     240
tgaaagatcg tttttaccgg caatccgatt cgccctgaaa tagaattcgg ccacccagcc     300
gctcggagtc tcttcgcttt ttcggcttcg agcagtccga atccctgtcg tcttggtggt     360
cggaggtagc ttgggtgccc tgactattaa cagagtatcg ccgacaagct cggcaaatgg     420
gcagaaagcg gtgtacacct ttatggcaaa cgggaaagaa ctatattgag acagccagaa     480
aagcagtaga aatcatcccg ggttgaaatg ctatgtcaat gattttatca ctcgaatggt     540
tatgcatact gtgcagccga cttggtagtg tcacgagccg gagcttgccc atttcagagc     600
tttgcttgct gggaaaacct acgatactgg ttccctccca atgtggcaga agaccatcaa     660
acaaagaatg ct                                                         672
```

(2) INFORMATION FOR SEQ ID NO:661

```
      (i) SEQUENCE CHARACTERISTICS:
           (A) LENGTH: 556 base pairs
           (B) TYPE: nucleic acid
           (C) STRANDEDNESS: double
           (D) TOPOLOGY: circular

     (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

     (iv) ANTI-SENSE: UNKNOWN

     (vi) ORIGINAL SOURCE:
           (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

     (ix) FEATURE:
           (A) NAME/KEY: misc_feature
           (B) LOCATION 1...556

     (xi) SEQUENCE DESCRIPTION: SEQ ID NO:661

agagcaagtt ttccatctcg ctgcctcgtc tgcgtcctgc cacgggcggt gggagcctaa      60
agatcctatt gacgatgtcg gtatggtaca gcttattatg ccttccgtct gttggataag     120
gatgtcgaga tcagcctgtc cacacggaga gtcgtgagtt tcgtgaccac gtgatgccgc     180
tcggtatcac ctcggtagtg ccggcagcaa gaccgaaccc ggaggatatg ccgaagagaa     240
tgccgtctgg agcaattcgc catcaacgat gcccgcagtc cggccgaaat ggctccgatc     300
ttcgccgact tggctacgag ccggtttgga aagactggga tgcttcatgt aacagaagat     360
tcttaccgta acgcctcgcg tccgaagcga aggatcttca taagaataaa ggcttgctct     420
ccggtcgagg aaagcagcct tgtccgtttt tggtttttatc gtttgaatcc ttacaagcga     480
atacctaagc tacgtggaaa gaggtattct ttcagcgtag cctncaagtt tttagtctcg     540
gtttaatggc tttacc                                                     556
```

(2) INFORMATION FOR SEQ ID NO:662

```
      (i) SEQUENCE CHARACTERISTICS:
           (A) LENGTH: 1416 base pairs
           (B) TYPE: nucleic acid
           (C) STRANDEDNESS: double
           (D) TOPOLOGY: circular

     (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

     (iv) ANTI-SENSE: UNKNOWN
```

(vi) ORIGINAL SOURCE:
    (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...1416

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:662

```
acttccgttt tatccagaat gttcttaatc ctcggatcgg attcgtagtc gacagcagat      60
gttctatgag tcggagcagt accacatatc cggtcgttcg tctccgtgca tcgtagaagt     120
atagagcacg cgaggctttt tccctgtttg gcagaggacg tcagcttgca aatcatcagt     180
ttacgatcct ttacggcttg ccaatgacgg aagtagtaca aagtgatgga tactttgttt     240
ggaaccttcc atcatgctga tataggcttc ataggtgggg taagcattcc attctatttt     300
tctcctgagc ggtagtcgaa catctcgaca gcgcgctgca tggtggagga gtcaagaatg     360
taggcttgag cccatagcgc aggaatgcct cgactcctct tcgctggcat aggcaatggc     420
ttcattggtt acggggtcaa atcgtcgatg gacatgatca gagccagctc ttgtagaacg     480
gccctatcag cactttgaat gagaagtagg cctcgccccg ttcgtcaaag ttgaaataac     540
tttggcctgt tgtgcctgca tgctgccgat gaaagtcagc aaagcaacaa aatgccaaga     600
agcaaaaaat tctttttctt cataaatagg ataattagtt tgttattgga ttcttgcagt     660
atccttttgc gagaaaaagg tgctcgtttt tgcataacgg tatggcagtg ggagcatatt     720
tttcgggcta aatgtctcgc aaagataaaa atattcctat gccattatct ttttgagcct     780
aaaagtcaat tgcatattcc acttagttga tagtttcagg atgggatgtt cccaaaggag     840
attgttgcat gggagtttca ttgagctctt ttgctgcaga gcgatttcat caagtttcca     900
gaaaggtcaa accttcggta tatggacaca gaagcaaaca gaaatttcat caagtttcca     960
ttagagaagt actcctttcc cgtcaaatca atgcttgtac cgataggcga gaaataagga    1020
atgattgtcg ctgattcttg cttcctgcac gatgcaggac gcgattgtca gctgattctg    1080
cttcctgcac gatgcaggac gcaattgtca gctgattctg ctcccgtaat gcgctaacta    1140
tcagctattt gcaactattt tataggactt tcattgagtc ttttgccgca gagttgattc    1200
ttaagtgttt ttcagattac ttgagtttgc agagagatcg catgaagctc tcctttcttc    1260
gtcaaatcaa tgcattatct gtcttgatca atatgagggg ggaagggtta ttgtataacg    1320
gtccaaaagg tgcctttccg gatcaaagtc caaataaaaa ccttgcaggt ctacttctgc    1380
aaggtttttt tgttttgtta cgaaagctcg gatttc                              1416
```

(2) INFORMATION FOR SEQ ID NO:663

    (i) SEQUENCE CHARACTERISTICS:
       (A) LENGTH: 589 base pairs
       (B) TYPE: nucleic acid
       (C) STRANDEDNESS: double
       (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
       (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
       (A) NAME/KEY: misc_feature
       (B) LOCATION 1...589

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:663

```
tacacgtgtc aagcccgtgc aactntccgc tttgctcgta acgatacacg tcccgaactc      60
ggcccaaacg aatcggtaga tcgcgatagg aatgtggatg atcntgaata tctcgcagtg     120
gtgagggcat tcattggctt tagcatgact cttctccttc ctgcggcgta ttgatcggac     180
ggaaagaatc ctgtcctatt tggcatagtg cccggaggtg atgtagagat tcttattgcc     240
gatatcggcg tgattacctg ttggtagcca aagtgcttct gtatctgctt cagaagtctt     300
ccaaacgcaa acggagctgt gtgcctcgcg gtagccaaag cggaagccgg cacctacatt     360
ttgggagaaa gcgaagagtt cgagctcctt acgatctttc gatggtcgcg cttcttagcc     420
tcttccaaaa gctcgagata tcatccaaca tcttttttctt tgggaaagag attccataga     480
ttcgtgtcag tgttttctct tttcgtcgcc gcgccagtaa gctccggcta cacttaaaac     540
```

ttgatcgctt taatgtaacc ggtattgggt aagtgaggac cgcgacaag

(2) INFORMATION FOR SEQ ID NO:664

  (i) SEQUENCE CHARACTERISTICS:
   (A) LENGTH: 1123 base pairs
   (B) TYPE: nucleic acid
   (C) STRANDEDNESS: double
   (D) TOPOLOGY: circular

  (ii) MOLECULE TYPE: DNA (genomic)

  (iii) HYPOTHETICAL: NO

  (iv) ANTI-SENSE: UNKNOWN

  (vi) ORIGINAL SOURCE:
   (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

  (ix) FEATURE:
   (A) NAME/KEY: misc_feature
   (B) LOCATION 1...1123

  (xi) SEQUENCE DESCRIPTION: SEQ ID NO:664

```
aatgatccgg aagccgatga agcgcgtctt tacggcgcaa tcccgatatg caggcgtcat    60
tcattttgct tgcaagtaag cccgtaggcg aatcggtgag aagccgcttt tgtactacag   120
gancaatatc ctctcactgc tgaatatctc gaactgatgg agcgattcgg cactcgtggg   180
atcgtatttt cctcatctgt acggtgtacg gacagccgga ggtattgccc gtaacggaag   240
aggctcgata caggaagctc tctctcccta tggcaatacg aagcaaatca acgagagatt   300
atccgcgatg ctatccatgc cggagcaggg tacaaggcta tactctgcgc tacttcaatc   360
cgatcggggc acaccccacg gcgcatatcg gaagcttcct aacggagtgc cacagaatct   420
gatcccttat ttgactcaaa cgcagcaggc atcagagccg aactgagcgt cttcggcgat   480
gactacgaca gcccgacggc tcttgtatcc gggactatat ctatgtggtg gatttggcca   540
agcgcatgtg gctgccatcg aacggatgct gaatgaagag aaagcgagga ttcgctcgaa   600
gtctttaata taggtacggg taggggcgtg agcgtgcgga gcttatccgt accttcgaac   660
gggtgacagg cgttgctgtt cctcatggat agtaggaagg cgcgaaggcg atatcgaaca   720
ggtatgggcc gagccaagaa agccaatgag gtgttgggtt ggaaagcttt ggagtcgttg   780
gaagcacact gctgagtgca tggcgttggc agcaacgctt gtcggagaag taaccgcagc   840
ccattaacgc acccgatacc ctatcttctg gcagatggac atctatcgac caaaatcact   900
tacctgaccg gcgtagggcc gaagcgggcg gagtactgaa ggaggaaata gaagtacgta   960
cctatctgga tcttctccat attttccctt tcgctatgtc gataggagtc gattttatgc  1020
catacgggaa tacgctccga tatgccctat atccagcttg cgcggtgtcc ttcgcaactc  1080
tccgaggtgg gcgaaggacg gcgcaagcgg ctgacggcta ctt                    1123
```

(2) INFORMATION FOR SEQ ID NO:665

  (i) SEQUENCE CHARACTERISTICS:
   (A) LENGTH: 2764 base pairs
   (B) TYPE: nucleic acid
   (C) STRANDEDNESS: double
   (D) TOPOLOGY: circular

  (ii) MOLECULE TYPE: DNA (genomic)

  (iii) HYPOTHETICAL: NO

  (iv) ANTI-SENSE: UNKNOWN

  (vi) ORIGINAL SOURCE:
   (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

  (ix) FEATURE:
   (A) NAME/KEY: misc_feature
   (B) LOCATION 1...2764

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:665

```
ggttcctccc caccatctat aaggcgcgcc agccagtaaa tagccgcgtg ggatcactgc    60
cccgaatact tttgataaag gcggatgcta tatcataggg agttcgcctc ccttgtcgaa   120
agcagcgggg ttttcttgca agcgctgcgt atcttttcgt tggtaatgac gagccggtct   180
tccacttcgc ttgtggcaga aggtcgagga tgttcagcag ctttcgtgca tcgcctccgg   240
cataggaagc agagcttccg tctcctccag tacaggatgc ttggcagcca gcagtcgtcc   300
cgatcgatag ccctgtgtgc caagtagcag cagatcctca tcatttgggg tttgagcaca   360
tagacctgac agcgcgatag gagcggacgt atacttcnaa actcggattt tcggtcgtgg   420
caccgatcaa gcgtcactat tctcgctcta cggctgccag aagtgaatcc tgctgactct   480
tgctgaaacg tgtatctcgt cgatgaagag gatggcgcgt cctcctttgt cgaacagatg   540
ccacgattgg attcgatgtc ggctattact tcccgcactt ccttcacacg gagctaaccg   600
cactcaatgt atagaaaggt gcatccactt catgagcatg atttcggcca gcgtagtctt   660
gcctactccg ggaggccccc acaggacatg gatggcgtct gtccctgctc gatcatctgc   720
cggagcacag cccccatccg atcagatgct gctgccccac atagtcggcc agcgtttttg   780
gacgattctc tcggccaagg gtatttgttt catgccgcta aggtacataa ttggatacga   840
tccgcatgta cgcgagtgga aactgccatt aaacgggaaa gcagaggaaa gtctatagaa   900
gtatcatttc cttattttta cagagcagat catcgctaaa aagacgaaga atacccatgc   960
cacaccatct gttgtcattg cttccctgct gaggtgcaga cttcaccact tcttcctata  1020
tattattata tagtatcggc aggctattca gccacggcac aaacggtgat caaaggtctg  1080
tcctcgcagc ggacaatgaa gccccgtat cttatgcatc catctattcg ctgaaacaaa   1140
gagcggagta gtggcggacg agagcggacg atttatctcc gcctccatcc gggacgctac  1200
cggctggcca tccgttccat gggatcactc ctcttgagac agagttgctc gtgggcgaga  1260
aaagcgagga gaagctttcc gactcagctc cgtcatctat gatctgaaag aggtggaagt  1320
gatggtaaac ggcctaaaga agatcctgcc tatcccatca tgcgcgaact caagcgcgca  1380
ctccagttta cgagcacatg gtaaagagct atcaggccaa atctatacca agggttcgat  1440
gcggctggat aagctgcctt tctggctacg tataagaaag cagatggcat aagtgcaaag  1500
gatctggaga aaaacgctc gtcatagaga gccaagcctc tctggaattc cggcatccga  1560
acaaatacac aagcaagtgc gcgcgatgcg ctcttcgata ccggatgacc tcaaatcgat  1620
acaacggatt atatgcagat tatctcgacc aacatatatg ccaaaggttc agtcttgatg  1680
gaatagtaaa catggcaagt cctatacgga cgggttactg gaatcgtaca cctacaaact  1740
ggagggtacc agccgggaaa aggaagaaaa gtgtaccaca tcagcttcaa aggcagaaag  1800
ggacgccatg agggcgaact gtgggtgatc gatagcatct ggtgtctgca ggcactaaaa  1860
ttgaaattaa ggcttacgat atgattcggt acaaggtcga tataagtctc atccgctcga  1920
aaaggatgtg tacctgccca ccacctatgc catcggtatg agatgcagtc gatgggactg  1980
aaactggagt accagtactt ttcgtccttg tgtacgattc gcttgagatc gaccgcaaat  2040
tgctatccac tgcccgaaag ctgagggact tcgcttccgt acgaaccgcg aagtaaaccg  2100
ccaccttgga tgctcgaatc ccgattggat acgctgggct atcatctgcc cgacaatata  2160
tgctgcccga taccgaattg caggccaagg tccgattcga ttcacagctt tcgatcgcga  2220
ctcttcctac tgggacgctg tagtgacggc accgttaccg atgaagaagc acagagctat  2280
gccaatcggg acagtctgat gcagcttttg agaaaaagcg gcggttcggt ggcggtcggg  2340
aaggcgaacg tacggccgta cttccatcct cggtgctatc ctcggcggac atgactataa  2400
atgggagagg ggactacact cggattcaac ggccttatcc gcggatcgct tatgactacc  2460
gctatacgga tggcttttgg ttgggacaga gcttttttctc cggcagaagt tttccaaagg  2520
tgtagacctg acgctgcgcc ctatactaat tatactactc ataggcggaa gctatactgg  2580
gatgtccgtg ccgatttcgc tacgctcctc tctcgggtgg actactctcc ctatcggcag  2640
gcaggcgagt gcagacctga ctggcccgtt tgccaatacg gactggcgca tacagctttc  2700
ctgaccacct tagtagacgg tcgtggtcat ctgatgctat atgaaagaag tatctgcgct  2760
tgag                                                                2764
```

(2) INFORMATION FOR SEQ ID NO:666

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 581 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

```
     (ix)  FEATURE:
           (A)  NAME/KEY: misc_feature
           (B)  LOCATION 1...581
```

     (xi) SEQUENCE DESCRIPTION: SEQ ID NO:666

```
ggctctaaac ctgcaaaccg ctttcgagca gataagacct ccggacacat acagaaatca    60
gcgtgatgca atggatgata tcttctatgg aagcagcact gtgaatggta gcacaagaga   120
ataatctttg ccgagacagc gaaaatcatc tcggtgcgat tatctttcga ttccaatctg   180
cacacataca aatgagttcg ggcttcgtcc ggctccatga aactccggct cttgccaaac   240
cgcagaagag atagcagcag ctatctcttc gcagtcgccg ttatagacaa tagttgacaa   300
tggagaaaca agcggagctt ttcctccagt ttcgttttta tatcgggaag ttctcctgat   360
gagcacctcc tatattcgta atgataccat acaggggcat attatgctct ccaaacgttc   420
catttccccc atttgcgata tccggcctca aatataccga gagtgtgttc ctccgccatt   480
gccatacgga aggggtactc ctatctgcga gttatagctt cggggcgagc ggacaatgca   540
tagtccttgc gcaataactg ataaaggaac tctttgacga t                       581
```

(2) INFORMATION FOR SEQ ID NO:667

```
      (i)  SEQUENCE CHARACTERISTICS:
           (A)  LENGTH: 545 base pairs
           (B)  TYPE: nucleic acid
           (C)  STRANDEDNESS: double
           (D)  TOPOLOGY: circular

     (ii)  MOLECULE TYPE: DNA (genomic)

    (iii)  HYPOTHETICAL: NO

     (iv)  ANTI-SENSE: UNKNOWN

     (vi)  ORIGINAL SOURCE:
           (A)  ORGANISM: PORYPHYROMONAS GINGIVALIS

     (ix)  FEATURE:
           (A)  NAME/KEY: misc_feature
           (B)  LOCATION 1...545
```

     (xi) SEQUENCE DESCRIPTION: SEQ ID NO:667

```
tgaacaaaga agctctgtcc tatcgtttgg ccggcaagga cattgcagag tgaatgcaat    60
ggacatcaag actcttattg aatgggtaga ttctctggtg aacatctgtt ggatacgcaa   120
cgggctattt ctatagaaat actgaaaaga tacggacacg cttgggggttt cttaaagatg   180
tggggttgga gtacttacga tgaaccgagc tgcagcatcc ttatccggag gagaaagcca   240
gcgtatcgtt tggctacgca gatcgggagc aaactggttg aggtcttgta catatggatg   300
aaccgagtat cggtcttcac caaagggaca atcttcggtt gatcattcgc ttcaggattt   360
gcgtgatata ggcaatacag tggtagtggt gggcatgatc aggatatgat gctgcacgcc   420
gactatgtaa tagacttagg acacgagccg gcagacatgg tggtgaagtg gtgtttgcag   480
gtagtccgga gagatggtgc aggctaatac cctgactgcc gattatataa gtggacgaag   540
cgtat                                                               545
```

(2) INFORMATION FOR SEQ ID NO:668

```
      (i)  SEQUENCE CHARACTERISTICS:
           (A)  LENGTH: 1088 base pairs
           (B)  TYPE: nucleic acid
           (C)  STRANDEDNESS: double
           (D)  TOPOLOGY: circular

     (ii)  MOLECULE TYPE: DNA (genomic)

    (iii)  HYPOTHETICAL: NO

     (iv)  ANTI-SENSE: UNKNOWN

     (vi)  ORIGINAL SOURCE:
```

(A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...1088

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:668

```
gtcgagttgc atagcgaact cggcgggtgc cttgtctttt ggaatgagtt gggaacctta      60
tttcggacta ttcatcatag gagaaaatgc tcttttgtcg aaaccggatt ggcatacggt     120
agataagaca aagataatag gagagtgggg gtaaggagca taaatggatg aatatacgcg     180
ttcattatta agccgtttta attcggatga taagtgttag gatagagata tttagcttcg     240
ttgaatcgtt tgtgtttttg caaatgtagc caattcctgc gacttccaag aggctgatga     300
actatgtgtg tcatttgtgt ctgtcctgtc gattgctcat aagagggcag gggatggccg     360
ttgctcgaca tggaaataag agagctttgc tgatgctaca taaggtgttc tatttggtac     420
gatgtacggg gataggcttt gtttttttccg taagtttgta ttgatattgt ttcttgcata    480
cacattcaaa ctattgacag catggcaagc gaaagaaaac tgaaaaagca gataaccggg     540
ccatttccga agtctttact gatgcattcc tgctcaaact ctttgtgaag aggaaaaaaa     600
cgcagaggtg gaaactatcc tcaatcgtat tctccaattc aagataccac cattgccaag     660
attcgttgca acgacggtaa gcacaacctg cactcgtaaa gaaatattat cgccggctcg     720
tggatgattt caaggagagc tgtccgagat cgtgaagagt atttcggcgt gtgcgtctga     780
taatgatttg tcacttacgt gcattaagca gaaatagcgt aacatataga ggttttttgaa    840
gttttttctca cgattgttgc tcaggatgat gggctggaaa gcctcgtccc atctgcaaat    900
ccgctccaaa gcgtcatttg cgtggctcct ctaccagcaa ttacgacttt ttgctgggca     960
aactctacta ttggtctatc gtcggaaagc cggcttcctg atgaaaaagg aatggttttt    1020
cttcctttg gaccgatctt cagggctatg ggaggtatcc cgatcgatcg ctcgaagcag     1080
gttccact                                                            1088
```

(2) INFORMATION FOR SEQ ID NO:669

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 1025 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...1025

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:669

```
ccttagctgt cccgtcgagc ttggtcacgg caaggcatt cacttcagtg ctgcggtgaa       60
ctgccttgcc tgttcgaaag cattctgacc ggtggatcgt ccaataccaa taaaatctca     120
tgcggagcgt cgggcactac cttctgctca cacgcttgat cttcgtcagc tcgttcatca    180
gattgacctt attgtgagac gtccggctgt atcgatgatc acgacatcga cgccgttagc     240
cacggcgaac tgactgtgtc ataagccacc gaagccggat cgctacccat ctgcgcttga     300
tgataggcac tcctactcgc tcggaccaga tctccaactg ctcacggccg cagcacggaa     360
ggtatcggca gccccgagca cgacgctctt gcggcctgac gaaagcgatg tgccagcttg     420
ccgatggtag tggtcttgcc tcgccgttta cgcccactac catgatcaca taaggtttgg     480
taccggaggg aggtcgaagc tgtcgccatc ggccgtggaaa catatttgcg cgagccactc   540
atctcttgac ggaggatagt cgtcagctcg gaggtggaaa catatttgcg cgagccactc    600
gttcctctat acgtttgatg atcttcaatg tggtatcaca cccacatccg aagtcaccag    660
cacgtttttcc aattcgtcca agacctatcg tccactttgc tcttaccggc tacggcacgg    720
gtgatcttgg cgaatcgttt tctttggtct tggacaggcc ttcgtccaaa gtctcttttt    780
tcttttcgag aataatccga ataatcccat atcgtatata ctgttatatc tctccttagt    840
tcattctgtt cttgtaatcc tcataatcga accggcgcaa cactctttct tcccgtcggt     900
gcgcagcagt acgatgtccg gatggcgtgc acgttgaaca tgtcgtcttc accgcggtag    960
```

```
tggagcatgt ctcgaatatc gtcatcgcca ctgcacgcga tcgaaactca gtcaccgatg    1020
aagcg                                                                 1025
```

(2) INFORMATION FOR SEQ ID NO:670

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 648 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...648

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:670

```
gcaaggagtt cggcttcggc tttcgctatg gaatcctgcc gagctgcttt atcgcagcct     60
tacgctgcgc ttctatttcc tgcggatcgg gacgattggc catgaaaacc caaagatcac    120
cagtccgatc agaactaaac ctataacgta tttttatcca tatattttcg ttgcgtaggg    180
attcttcggc accgactcgg caccctatc ttgttgcctg ttcgctacgg tatgtcagag     240
gggagaaaaa tttcacaccc ccccaaagaa ccgacaggca aagcgattat tcttatcttt    300
ttttctcgtt ttgattgctt cacgaatgaa agccatgaac aagggttggg attgaccacc    360
gtactattgt attcgggatg gaactgtacc ccacgaacca gcggcaggca ggcacttcca    420
cggcttctac caagcccgtc tcggattctc gcccacacat tgcataccgg ctttttcgaa    480
agcttcgcga actggctgtt gaattcgaag cgatggcgat ggcgttcgcg cacgaattct    540
tgccataggc agcagccaat ttcgatcctt tgcgcagagc acagtcgagc gcccaaacgc    600
atggaaccgc catatccgta accgctctgt cgtcatcggt cgtgacct                 648
```

(2) INFORMATION FOR SEQ ID NO:671

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 386 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...386

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:671

```
atagggtgag cttatcgcag gcgttcggct gcccgtatca tggcttcatc gctcctatgc     60
cacgaatggc cagatagtgc aggatgatgg agactatcgc atgcagagcc aaaaacggaa    120
tccgaactcc aagttctcag ccgagcaatc tgccaaatct gcatcccag atagataaga     180
aaacctatcg tgacgagata ttgaagatac atagtctgat ctgcaagatt cgctttttgt    240
agaggagatg gtagcaaacg agatcagtac gataatggca tcaagagcaa aaagccccaa    300
```

```
gtggacttga ccagcgcatt ggtagccggt gcatatagtc ctatatggtc atcgcgtatc      360
cttggccttc cggccttatc aaaagc                                            386
```

(2) INFORMATION FOR SEQ ID NO:672

     (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 2443 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

     (ii) MOLECULE TYPE: DNA (genomic)

     (iii) HYPOTHETICAL: NO

     (iv) ANTI-SENSE: UNKNOWN

     (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

     (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...2443

     (xi) SEQUENCE DESCRIPTION: SEQ ID NO:672

```
tggtttccac ttgactccaa gcgtattgac ggcttcctgc ttgtccacga gccgttgtat      60
ttgagcacac cccagctaaa tagcaggaca aaaactgcat aatggcaatg atgattactg     120
ttccttttttt catattcatt ctatgttacg ttactattag gtttatctga atgtactact     180
tacgacgtct gacagggttt tgtctttctt gaccgaccag ccgaaatagc cgagaaagtc     240
cccaacgaga agtattcgcc atgcgaatat gccagcaggt ttgctttctc catacgaaag     300
aacctgtctc cgggttgata tattgttcgt cggcacggat attaccacat cggccataaa     360
catgtcatgg ctaccgagtg gaatgacctg tctaccttgc actctatgct gaccggcgat     420
tcggccacca aaggagcttt gtcagcttgg ccggctccac ggtaaggcct gtctcggcaa     480
acttgtcata tccttgcccg aacggacacc gcaccagtcc gtctgtctgg ccatgccgac     540
gtagtcaggt tcaaaccgaa ctcgccactc tctttgatga gagcatagag tgacgctccg     600
ggcgaatact gacatagcac ataggcggct ggctgcaatc gtccccaccc aactggccgt     660
aagcaaatta taatcctccg gccggggcca caactcacca atatggccgg tagcggatag     720
ataagtgtgc cgggttccaa tcttgtctca ttgtttcatt cttagaaaac ttacgcaaac     780
tatacaactc gatgcggtca ccggctagtt ttcgctcgca gtagtcgcat cgagggtgca     840
ctgctcggca tctatcacac ggaatcgggt ttgcatcggt tcttgttcgt aatacacttc     900
ggattcggac aacggacgag acccacaatc tgtgtggtac ttccacctga cgttttttcta     960
caacttcata gtcccgaata tgttcaggcg cacattcggg gcaataagag cgatgcggtt    1020
caattcctct cttcgaaagt cttgtcctct atcttgataa ctcctttcga accatggccc    1080
gactgcgcaa attgttgccg atggtgatcc gcttgtccaa atcatccgtt gcaggagagt    1140
agccaccttg aacagtttcg tcggggggat atggtcatca cgatgccgtt tctaatcgcg    1200
gcgacgagca tttcttcctt tttcatacaa tatctgctta gtttgcaacg tctatgccga    1260
gcacttcaca aatgtggact gcctcgtata aagcccgttc agtgcttgcc ggataaagta    1320
ggcttgggat tgtcatccac atcataggca atctccccca cacgaggtag cgatgcagta    1380
cgcgcagatt cggacggctg tcggacagca tagcgttggt cgcacataga catctttgac    1440
ccgttcatat tcctccagat ccgtaaaccg tcacgttgta ctcgtgtcat gtagagaatg    1500
tcgcagttgt tgatcacctt tcgtcgaaat gtttggtttc cgtataaggc agatcatgct    1560
ctcgacaaac tgcttgtatt cttccggaag agacagctct tcgggagcaa cgaagataaa    1620
cgagggcgga agtcgcgacat accctctatc agagaatgga tagtactcca tacttgagat    1680
cccctaccat agcgatagtc ctgtcataca gcgtgcctgt gttttgcgaa tggaatagag    1740
atccaataaa gtctgtgaag gatgtggttg gctccatcgc cggcgttgac taccggcaca    1800
cggcttacct ccgagcataa cgagccgccc cttccagata gtggcgcata ataatcagat    1860
cgcatagttg cccaccatgg aaatggtatc cttgagcgat tcgcctttcg tgagctggag    1920
gtggatgcat ccgaaaaacc gatgatacgg cctcgaggc gttcacagcc gtctcaaaac    1980
tcaggcgcgt acgggtagaa ggctcaaaga aagagtggct acgaccttac cctccaaaag    2040
gtgccgattc ggattctttc gaatagctct gcccgatcga gaatgcgaag aatgtcctcg    2100
gccgaacctg gtcaatagat acgatatgct tcatctttta aggagtataa ttgattaatg    2160
atatggacgg aagcaaagct cacttcaaag cgaaagaagc cttaacgtta tgcttgccgt    2220
cttcatcttg gaagacgtat tgaacgaacc tcccagctat aatcttcgtt cgagttgagc    2280
cccactatct ggaacacgcc catgaagaag atagcatctt acccacggag gaaccgctcc    2340
cctccgcaat gacgaagcac gattgaaagc gtcttcggag gcattgcgca gcatctccac    2400
ctcagatcat tgagcttggt gtagtaatag gcccggacgg tcg                      2443
```

(2) INFORMATION FOR SEQ ID NO:673

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 582 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...582

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:673

```
cggtttggat ttggctctcg gtgtaggcgg ttaccctcgc ggacgtattt cgagatatac   60
ggaccggaat cttccggtaa gaccactctg gctatccagc cattgccgaa gcgcagaaag  120
caggtggctt ggcggccatc atcgatggga acatgctttc gaccgcacct atgccgaaaa  180
gttgggcgtc aatgtgataa tctctggata gcacagccgg acaacggtga acaggctttg  240
gaaatgccga gcaactgatt cgctcttctg ctgtcgacat tatagtcatt gacttgtcgc  300
agccctcacg cccaaagcgg aaatagaggg tgaaatgggg gacacaaggt tggtttgcat  360
gcccgtctga tgtcgcaagc actgcgtaag ataccggagc catcagcaaa tccaatacaa  420
cctgtatctt catcaaccag cacgagagaa gatcggtgtt ttgttcggca atccggagac  480
caccacaggg ggaatgcact gaaattctat gcatccatcc gcatcgacat tcgcaagaga  540
caccgatcaa ggatggcgaa gagatcatgg gacacctgac ca                     582
```

(2) INFORMATION FOR SEQ ID NO:674

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 1547 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...1547

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:674

```
gccggcaaaa tcctgattcg aagcgatcta aggaaaagaa agaaccctcc atcatggcaa   60
aaagcatcca ggcataggtg cctaatagat agaaaggctg cgcagggtca gaacatcctg  120
tatggtttgg agcgtatggg tagagggtag cttggcgaaa tctggtacat aggcatcccc  180
ccgaagagac tgttggccaa taggagtgtt ctcctgtctg tgcctcccaa tcgcgtacgt  240
cctgcccgta ccgctggctc ccgctacgtc gccctggaac agtacacgcc cgtcaatgag  300
gcgggataga aataggccaa agcgagggct atgaaaagga gtagaccgca gcataaggta  360
ggattttgcg ccaatcaggc tttgtcttat cgtggtggtt acggttccgg cagcagctgt  420
cggcttttcg ttttctttca tatgtcgttt gtttttcggt tacaaagtta aaaaaccatg  480
```

```
tgattggctc gcctacgacc aactgcttct ctgaacgttg agcagagaag tatcctccga    540
cattgttatt gtatgcaaga ggtcagaaaa tgagcagttc aaaccttgga caagctctct    600
ccctattcta tatacatatc tgaggacaaa gcgaaacatt gaggaaagag gcggcatcca    660
tttgtttctt gccgggcatt tggagcagag tatacgtatg accccttgc gtgtcatcac     720
gtcgaggttt ttctttccca tatgatggag ccgaatcggc ctctgtgtcg cggttctcgt    780
tctacacttg ggtacggtat attttcagca cgatggactc catccttgga cgagaagctt    840
ggtccaagct gtaggagcag gcgatatgct gcggatgaaa tttgtacctc ttcagccggt    900
ttgtcccaat cgatacggca gtcgtctttg aaatcttcgg agccggtcga gcatcaacat    960
agcccggaag ttgctcctga gtatggagac gggttctcct tcgagaaaca agtccactgt   1020
gtgcaccaaa cggatgcacc gagagtagcc atacgttcgt acaattcgcc gaaagtcttt   1080
catgtcctat aggcaacttc tcttgcagca gtacttcacc cgtatcttct catgccggag   1140
gcggaaggtg gtaactcccg tttccgtatc gccatgcgta tcgcgtggtt gataggggct   1200
gctcctcgat acatgggcag cagaggccat gcagattgat tgttcccatg gggggcattt   1260
gccatacgga gcgagaagca tacggaaagc cactacgatt tgcaagtgcg gctgataagt   1320
ccgagttcat cgagaaaaga ttcctcgttc agattgtccg gctggagaat agcagaccca   1380
attcctgtgc gtatagtttg accatactgg gacttacctt agtcctcgac ccataggctt   1440
gtccggcata gtgaccacag cttttacttg tatccgtttt cgaccaaagc tcggagtgcc   1500
ggaacagcaa aatcggccgt cccataaaaa tcaatcgtag ttcttct                 1547
```

(2) INFORMATION FOR SEQ ID NO:675

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 626 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...626

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:675

```
gtggctccgg aagcgatcac agcttcttgg actatatttt ttcgttagag gtggagtaca    60
ctttgagcaa aagcgtattt acacaagacc ccaaaaacga ctatcaatag agtagacctt   120
tcattaggca gtacatctcc ttctcttgat ttaatacttg gccactaatg ggagtcgtat   180
tcgaaatgaa taagaacttg atggcttcga cattggtttc atttccaact ttgtggacta   240
tgatcccgct atgcgtggtc tgaaccgata ataatagaag aagactgtgg atggctgatt   300
ttaatccttt gngagcacta agtatagaga tccaaatgat gttgatgaca attcggataa   360
taccgtgggt ggagaacgct cccataactt ccgatcactt acccgggcca ttacgtatat   420
ccgaagcaat ctttcaatta tctcccggac atacaccgac aaagaaagat ctggtcttta   480
aacactgtat ggtattccgg ctttggcata ccgataagga aggcgatcgt tatctggaca   540
ctttttcaaga tcaccaatct aatgagatac agatgggatc aaatacgaga cattactctt   600
tttatggttg gagttggnca tatgta                                        626
```

(2) INFORMATION FOR SEQ ID NO:676

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 1327 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

(iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
     (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
     (A) NAME/KEY: misc_feature
     (B) LOCATION 1...1327

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:676

```
ggccgactgg gcttcctcac cgatgtcgat tgccacgagg cttcggagcg atcacacgcc    60
tgctggacgg cgacttcacc atcgagaccc gttccctgtg gaagtgaccg aagacaacgg   120
ctcctctccc tcctacgccc tgaacgagca gccatactca agcgtgaaac cggttcgatg   180
attcgggtga atgcctcctc aacgacgact atctggcggc ttacgatgcc gacggcctcg   240
tggtgccacg ccctccggct ccacagccta ctcgctgagc gggaacgggc ctatatcatg   300
cctgcctgtc ggaacttcgt ccttacgccc atcgcccccc actgctgaat atgcgtccgc   360
tggtcgttcc ggacgacacg gtgatccgcc tcaagtggat tcgcgcagtc ggaattacct   420
cttggtgctc gacggacgaa cagaacgttg ccctgcgata cctccatcct gctcaaacga   480
gctcctcaca gctgcgaatg atccgtctgc gtccgcactc cttcgccgaa accctgaggg   540
taagctcatg tggggagcag ccgtaagata aagacacttg cgacggtgac aacgagccaa   600
cggacactta ccatagacta ctcccataat ggaagaaata caaccatggt gctgcgcacc   660
gaagatctgg tcaaacgcta ccggaacgta cggtcgtgaa tcacgtatcg atagaggttc   720
ggcaaggaga gatcgtggga ttgttcgggc cgaacggagc cggcaagacg acgactttct   780
ataccacg gggctggtcg tccccaacga aggacggata ttcctcaatg atcggacatc   840
acccaatacc ccgtctacaa acgagcgcgt gccggcatcg gcatctggca caagaggcat   900
ccatattccg caaaatgtcc gtggaggaca aatcctctcc gtcctcgaaa tggccggact   960
gcccaagacc tatcagcacg aaagctggaa agcctgatag ccgaatttca ccttgagaaa  1020
gtacgcaaaa ccttggcgac cgcctctccg gcggcgagcg acgccgtgcc gagatagccg  1080
ctgcctggct atatcgcctc gcttcatcat gctggacgaa ccctttgcgg tgtcgatcct  1140
atcgccgtac aggacattca ggccattgtg gccaaatcaa ggacaaaaac atcggcatcc  1200
tcatcaccga ccacaacgtc cacgaacgct tcagcatcac ggatcgcgct tacctccttt  1260
tcgagggcaa agtgtgtatc agggcacggc cgaagagctt ggctgcgaac gaagtcgtaa  1320
gggaaag                                                            1327
```

(2) INFORMATION FOR SEQ ID NO:677

     (i) SEQUENCE CHARACTERISTICS:
         (A) LENGTH: 316 base pairs
         (B) TYPE: nucleic acid
         (C) STRANDEDNESS: double
         (D) TOPOLOGY: circular

     (ii) MOLECULE TYPE: DNA (genomic)

     (iii) HYPOTHETICAL: NO

     (iv) ANTI-SENSE: UNKNOWN

     (vi) ORIGINAL SOURCE:
          (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

     (ix) FEATURE:
          (A) NAME/KEY: misc_feature
          (B) LOCATION 1...316

     (xi) SEQUENCE DESCRIPTION: SEQ ID NO:677

```
gggtttctca agaagcacgg tggtggacat cgtagagcat caaggcattc cactgctatc    60
gtggatgtgt ccttcacctg ccacatgccg gactgtctga gatgccttac aaacccgtca   120
ttcgtggagc gcatcaggag ccggtaccgg cctgcccaca tacaggatag gcggatgcag   180
ctgtctgagc ggcgactcat cggtgactgg agtttcgatc ggccgttgca ggtgggcgat   240
gaactatatt cgaagacatg ctccactaca cgacggtgaa gaacgaccat gttcacggtg   300
cacgccatcc ggacat                                                   316
```

(2) INFORMATION FOR SEQ ID NO:678

(i) SEQUENCE CHARACTERISTICS:
    (A) LENGTH: 2872 base pairs
    (B) TYPE: nucleic acid
    (C) STRANDEDNESS: double
    (D) TOPOLOGY: circular

(ii) MOLECULE TYPE: DNA (genomic)

(iii) HYPOTHETICAL: NO

(iv) ANTI-SENSE: UNKNOWN

(vi) ORIGINAL SOURCE:
    (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

(ix) FEATURE:
    (A) NAME/KEY: misc_feature
    (B) LOCATION 1...2872

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:678

```
gctcgggacg gatttccgtc ggcacctgga aggtagcacc accgatacgc ggctcttcac      60
ttctacctga ggagtgatat tatcgagagc cgccttccaa tctcgagggc agacttctct     120
tcgtttgagt gcttcgtctt cacgatgcca aagcaccgta gaagatactg aaagctgtgt     180
tcttctttcc atcataatta ggtgattaac gaacttagtc accctcacat caccatagac     240
gggatcggca ggatctgtct ttttttaggt tttgctttc tcattgtctc aaaaatttcg      300
tttttgtcga ttggttgccg tttcattttt gtcttcaacg ctccgccgga gcatttactc     360
aaccctgttt aagcctatcc aattgaactc aaaccggttc ttaaataatt tgttggttgc     420
gcccttgatc gtagcgcgat ttagattggg gaagtgattc gtccttatcg gtctccggcc     480
tcgctcatcg ggccgacgag tccgcttagc ggctcttact tcttaccttt agcggcaggg     540
cctgtccggg cttcggacgc ttggcaccgt atttggaacg acgctgcgac ggccattcac     600
acctgctgta tcgagcgtgc cacgaacaat gtgataggca caccgggcaa gtccttcaca     660
cgacctccac gaaccagcac gatgcttgtt cctgcaagtt gtgaccctct ccggggatgt     720
aggcattgac ttcttggaat tcgtcagacg cacacgcgcc accttacgca tagccgaatt     780
cggctcttgg gcgtagtcgt ataaacgcgc acacaaacgc cgcgacgctg cggcacgaat     840
tcaatgccgg cgatttgctc ttatccgcga aagattcacg acctttctaa ccaactgttg     900
aattgtaggc atttcttctt tctttaaaac ttgattataa ttatctcttt cctaatctat     960
tacactgcca actatacgag agtggcgcaa aggtacatat attttcccaa tccacaacag    1020
tccccgcagt ttttttcac ggcaacgctc taatactcaa tagtatcaac cgacatctta     1080
ggccgaactg ttccgcccga gcgagagatc cgaaaaggtg gatgcgcccg aaaagaaaga    1140
gaatacaaaa cagcccgaaa aagtgagata cagcgtcagc cacagaaaag aaacgcactg    1200
catatattca cagaaaagaa acgcatgcat atattaatgt acgcgcgcga gagatgctga    1260
gggcagcact attcgtccaa agagagaaaa cggaacggaa aaggacaacc atccagcaaa    1320
ccgttacgcg ccacaatttt ctgtttcgat gctccgcaaa acgtggcgcg ggactttttc    1380
gtttttggttc gggaagtaaa aaattctcgc gccacgagga aaaattctca taagacttttt   1440
cccgaaaaca cgcgccgcaa tcagagcaat atggttcgag aaaatcagat cggaatatat    1500
ccgcccaaga gcgagagggt agctatgaag ctgtaccgac agcctcgatc gccacaataa    1560
ctaccgcatc agcgaagccg tcagagccaa gaagagcaag caatagacca caacgagatt    1620
gtccgccaga agctccgcca ccaagagcag aggaatagct gcttgtgtcc cagcaaaaca    1680
aaaggaatag gagcaatgca ggtagcccgt atagcacccc acccgggcat cgctgtagaa    1740
aggtagggcg agaacgttca gcaaaatagc tggcaggcta tgtacgcctg agcgataatg    1800
tgctccgtca gatatatgct ccggctcctt tttgtcggaa agccgctttc gtactcacgg    1860
cggaatggga agaatactga tgatcctgac agccttgttg ccttgaaacc attcatcagc    1920
aggctccata ttcttgaaaa gaaagggagg gacttcaacc attttctgc tcggtgacaa     1980
acctcatttg tttgtaaaaa aaggctcttt ccccgtgtgt cgctcggcaa tcatttctcc    2040
gctatcgctg ccgactgctt attctccttt tgcaaggagg atatttcttt ttgatccatc    2100
cgatactttg acgcgtaagc tcttcgccaa tgggcttttt ctgcaaggga tcaggtcgat    2160
cagttgtgca aagatgatgt acagagaggc cagcacgaaa agggctgaaa gggacggaag    2220
tagacaaccc tcttgccacc gataaagtcc cgtacaaata acccgggcgg tagagcagct    2280
ccacgatagt acgcccgaaa ccgtgtcgat attggtgaag ccgcctatca catttcggat    2340
catctgccgg aatgataccg tccggtgcga gaggtttgtc cgcagcggtt gcagaaattg    2400
ccgtatatcc atctccgcag ttttggcata tatgtatgta tgggtctgca gtggagtcgc    2460
tctgccacgc atcagtctca actcgaatgc gcggattcga cccgaagggg aaagagaagt    2520
gattgcaacc gctgatcgat ctttcttgca gtagtctgcg cttccgtagg attgcccaaa    2580
aagccagccc ggtaatgcag atattcccca ttgtcccgaa gtggccaaat cttctattgc    2640
caaccaagga gcgatgcaag catgaggatc tgcaatgagt tggccatttt tctctcgaat    2700
gcccatgctc cccgtttttc tgtttcttcg aagtactatc gcgcaacctt ccatttttt     2760
```

```
cttcgttttg ctactcgttt gcattatctg aattcacttg cttgcgtaca aatatagtta    2820
tgacaaatgg agggcgtagc acctcggttc ggtcgcttac gggtgagctg cc             2872
```

(2) INFORMATION FOR SEQ ID NO:679

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 542 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...542

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:679

```
gtaagaacgg gatacagggt cgaaataggg tatgcttatg gcgggtatgt aaactttccc     60
gtctgacggg gtaccacata atactcgatc gtacgctgcc atcggcaccc gaagtactta    120
tgcgaaggct gctctcggcc ttggagtgta ttgttcgaag ctgtcgggaa atctcacttt    180
gggatctccc atcaactgat atttccgctt ccgttaatta cgagcttgag tgtaagggct    240
tcgttgtttt ggcctgacgg tcattgaaag aggctgagat ccgataatta ccaaagcacc    300
atcgaatcct tggggtttcg gttcaggcaa gggagcgaca tctttgtgac cggattggtg    360
gtcagagtcc tccgcacatt ctcatacggn tgagtacaaa gaagtcatct atgtcgtcta    420
tctcccgtcg gaccgntact agacacgaaa gttgcccgat ggaatagtca gcttaccgct    480
tttttgagga agagcaacga ctgcttgaga acggttgtct gatagttccg tccttcatac    540
tc                                                                   542
```

(2) INFORMATION FOR SEQ ID NO:680

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 865 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...865

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:680

```
gtcagattat gtgcagcctc ctgtggtaac aagaactgct ccccctcgaa gaaaggtgca     60
ctccatccgt atcggtacgc agaagatgaa atacggcacg cggaagaaac cgatggtttc    120
tatctgccga tacaggtcgg caggctctct tcgatgtgga tcactctcac atacgagtcg    180
tccggcagtt cgtcggatgt actccttcca cggattgcac ttcgccctct tccgtcggga    240
tgggacgcca tgcgggtcga aaagcggatt gcccaggcgg actgctatcc gctctgctct    300
tcatcggaca gatagtgctc ctccttgcag gcttgtgtat gccttcgctg ggttcatagc    360
```

```
cggagtgttc ggacagatac ttttccaaaa gctgtggcgg cgaatcacct tgagcgcata    420
tttccgtccg ctttcggtca gtgcgagtcc ggaggcaggc agtagccttg tttgtgcagc    480
agatcgagta atactgttgg ttgcttatct tcagcccggt cagggctgcc agtcggtctc    540
attgacgggc agaccgtctt cttccaaaga atagatagct ttgagcgttc ttcggacaga    600
cggcgtacat cgaagcgaaa cagaagattc gagaataatt catgcttcta taacttctat    660
tattaccgaa agtggtcggt ctgttgcctg tggcacaacg ttttcagtat gacaaaagtg    720
cttattttat cgaagatccg caaactgcag gctctctggg ctatttacct gcattgagta    780
tccgagcgga gtgcttctac aagacggttc catttcttcc tgactattcg gcatgacgac    840
                                                                     865
tgaaatcgtc caaaaagttt cacac
```

(2) INFORMATION FOR SEQ ID NO:681

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 2502 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: double
        (D) TOPOLOGY: circular

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: NO

    (iv) ANTI-SENSE: UNKNOWN

    (vi) ORIGINAL SOURCE:
        (A) ORGANISM: PORYPHYROMONAS GINGIVALIS

    (ix) FEATURE:
        (A) NAME/KEY: misc_feature
        (B) LOCATION 1...2502

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:681

```
ccgattgcgc tttgctttca aaaccacaat ccgatactca agaccaaacc tatgctccgg      60
aatcgtgggn acgcgaacga acagatcagt actaccggaa tgggcagata tgcctcatgc     120
cgaattggcc gaaggagctt atgtcgactc ttttgtcgct cttcggctct cgtacatgat     180
tgcagtgctt tcaccgggaa tatcagatcg tggggcgtcc ggccctcttt atgcggaaga     240
acggagcctt cctcacgggc tcaaccgagc tgcccaagag gccttcgcgt tgcagatatg     300
gcagattctg cggaagacat cgattcgttt ctccaaaaga tagagagcgc agacccgatc     360
cagtagccga taggcgtcgg gtcttcatcc ggactatttg ctccctcccc gaggggctac     420
tgcctcagag gtcatcatcg aactttgctc acatcgcgtt cgtaaaatcg tcggttctcc     480
acgcccaaaa cgtggcgcgg gaactttttc gttttggttc gggaaagaaa aaattcccgg     540
cgagaacgaa aaaattccca cgccacttcc tttcagcttt tggttcgcgt tcgggcgact     600
ttcggctcgt attttttccct gatcgactga atgactcgcg ccttgatgcc gttttttcttc     660
tatttgtatc ggttgttctt gccatagcat ggcattgaac tttaatcatt attttcgcac     720
cggactttga ttacatgtaa ttatgaaaag aatagtattg attcgccacg gcgaaagctt     780
gtggacaagg aaaatcgctt tacgggatgg acagatgtgg atttgtccga aaaggtattg     840
aagaagccaa gaaagccggc gagctcatga agaaagaagg cttcagttta ccaaagccta     900
tacttcctat ctcaaacgtg ccgtcaagac ctgaacggtg tcctcgatgt aatggacttg     960
gattggatac cggtggagaa acctggcgtc tgaacgagaa gcactacggc atgctgcaag    1020
gcctcaacag gccgagactg ccgagaagta cggagacgaa caggtactca tctggcgtgc    1080
agctacgacg tcccccccac gcctatggag aaagaggatc cgcgctcccg ttcatggatc    1140
cgcgctacaa aggtgtgtgc gagaaagacc tgccacgaca gaagctctnt gcgacacggt    1200
aaatcgtatc ctcccctatt ggaacagacc atattccccc acgctcaagg agcatgacga    1260
ggtattggta gcagtcacgg caacagtctg cgtggtatca tcaaggtgct gaaaaacatt    1320
tcgacgaaga catcatcagc ctgaacctcc cgacagccgt gccttacgtt ttgaatttga    1380
cgacaatctc cgtctggtga aggactattt cctcggcgat cagaagagat caaaaagctg    1440
atggaggcag tagccaatca gggcaagaag aataaccccc catcgccggc cctttcctat    1500
tctgcttttc gacagaagga aggagaaaaa acaagaagag agcgttgcac gaccgttagc    1560
ggtgcaacct ctcttttcat ttcatctttt tttgctcggt tgccgcagat gttatttctc    1620
cggaggtctt tctcctacaa gaccttgtcg tacacatgca tcagggtcgg gctacggctt    1680
cgggtgagaa acgctctata taggtacgcc cgtcgctatc atcttctcgc ggagagagct    1740
gtcggagagg atgctgtcca gcatgatgcc atcatttccg catcgtcggg gtcggtgtac    1800
agggacgaag ggctccggct tcttccagac acgaacccgt ggccgcaacg accggcacgc    1860
ccaagccaag gcttcgacaa tcgggatacc gaatccctcg aagcgcgaag gtagacgaat    1920
acctctgctc cgcgatagat gcccggcagg aaagcaaatg gacatcgtgc agcatgacga    1980
gccggtctgc cacacctgat cgctctgcaa ctgctgcacc tccgcacagt atggcgtacg    2040
```